

Chapter

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# 1

## PROJECT MANAGEMENT PRINCIPLES

## PROJECT MANAGEMENT HUMOR

Project management is the art of creating the illusion that any outcome is the result of a series of predetermined, deliberate acts when, in fact, it was dumb luck!

Some people are under the impression that project success is accomplished by chance and luck. Nothing could be further from the truth. Most people will agree that project success is accomplished through a structured process of project initiation, planning, execution, monitoring and control, and finally closure.

Some companies rely heavily on an organized and consistent project management methodology to accomplish their goals. Some methodologies are based on policies and procedures, whereas others are developed around forms, guidelines, templates, and checklists.

Project management is an attempt to get nonroutine work to flow multidirectionally through the company, usually horizontally, rather than in a vertical, sometimes bureaucratic manner. To accomplish this multidirectional work flow, a project management methodology is required. One of the purposes of this structured methodology is to facilitate the job of integrating the work across various functional units to meet project objectives.

When projects reach completion or closure, the project team is debriefed in order to capture lesson learned and best practices that may be beneficial to the organization and for use on future projects. In most cases, the best practices that are discovered are used to improve how the project and functional managers interface and to increase efficiency in the use of organizational resources.

## PROJECT MANAGEMENT

### PROJECT PLANNING

- Definition of work requirements
- Definition of quantity and quality of work
- Definition of resources needed

### PROJECT MONITORING AND CONTROL

- Tracking progress
- Comparing actual outcome to predicted outcome
- Analyzing impact
- Making adjustments

The *Guide to the Project Management Body of Knowledge* (PMBOK® *Guide*) identifies five domain areas in which the project managers must perform:

- Initiation—Defines and authorizes the project
- Planning—Defines and refines project objectives
- Execution—Integration of resources to meet objectives
- Monitoring and Control—Measuring progress and identifying variances
- Closure—Acceptance of project deliverables

The amount of time and effort that project managers must put forth can vary based on the domain area. Many project managers are not brought on board the project until the end of the initiation process. Executive management, marketing, and sales may take the lead during project initiation.

Project managers and functional managers are heavily involved in project work during planning, monitoring and control. During project execution, much of the work is accomplished by the project team and the functional managers. If the project team members report directly to their specific functional departments, the project manager's main contact with these resources may be during monitoring and control of project activities as tasks are executed.

During project closure, the project manager is expected to make sure that all project documentation is complete and ready for the archives. Some companies bring on board project closure experts to shut down large projects.

## PROJECT NECESSITIES

- Complete task definitions
- Resource requirement definitions (and possibly skill levels needed)
- Major timetable milestones
- Definition of end-item quality and reliability requirements
- The basis for performance measurement

Planning is often regarded as the most important activity for a project manager. The project manager must understand the following:

- *All of the tasks necessary to accomplish the deliverables.* Many times the project manager does not possess a command of technology and must rely upon the functional managers for clarification and identification of project components, activities, and their respective risks.
- *Functional skills needed to accomplish the work.* The functional managers may be in a better position than the project manager to identify the skill levels needed to complete project work.
- *Major milestones identified by the customer, whether an internal or external customer.* The functional managers must verify that they can meet the milestone dates. Functional manager commitment is essential.
- *Quality of the deliverables.* The functional managers must confirm that they can meet the customer's quality and specification requirements.
- *Performance measurement.* The functional managers and project manager must agree about how to measure project performance with reference to the work breakdown structure (WBS) and detailed activity lists developed by the project team. It is possible that the WBS may require some changes and updates to support the functional manager's tracking processes.

## RESULTS OF GOOD PLANNING

What are the results of good project planning as seen through the eyes of the functional managers?

The following points define the results of good planning:

- Assurance that functional units will understand their total responsibilities toward achieving project needs.
- Assurance that many of the problems associated with the scheduling process and allocation of critical resources are identified and are addressed through risk management.
- Early identification of risks and issues that may jeopardize successful project completion and the corrective actions required to prevent or resolve problems.
- A plan has been established for the purpose of guidance, problem solving, and decision-making, which will allow functional managers to spend more time supervising their people rather than resolving conflicts and solving problems.

## PROJECT CHARACTERISTICS

- Have a specific objective (which may be unique or one of a kind) to be completed within certain specifications
- Have defined start and end dates
- Have funding limits (if applicable)
- Have quality limits (if applicable)
- Consume human and nonhuman resources (i.e., money, people, equipment)
- Be multifunctional (cut across several functional lines)

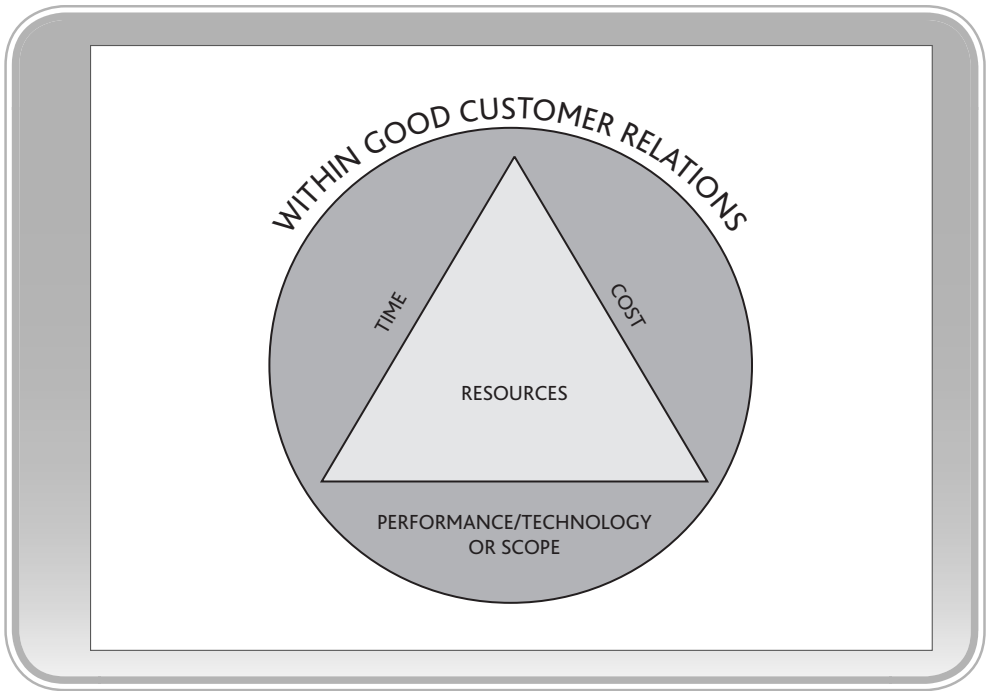
Before continuing on, we should provide a definition of a project. Projects are most often unique endeavors that have not been attempted before and might never be attempted again. Projects have specific start and end dates. In some cases, projects may be very similar or identical and repetitive in nature, but those situations would be an exception rather than the norm. Because of the uniqueness of projects and their associated activities, estimating the work required to complete the project may be very difficult and the resulting estimates may not be very reliable. This may create a number of problems and challenges for the functional manager.

Projects have constraints or limitations. Typical constraints include time frames with predetermined milestones, financial limitations, and limitations regarding quality as identified in the specifications. Another typical constraint may be the tolerance for risk and the amount of risk that the project team or owner can accept. There may also be limitations on the quality and skill levels of the resources needed to accomplish the tasks.

Projects consume resources. Resources are defined as human—people providing the labor and support—and nonhuman—equipment, facilities, and money, for example.

Projects are also considered to be multifunctional, which means that projects are integrated and cut across multiple functional areas and business entities. One of the primary roles of the project manager is to manage the integration of project activities.

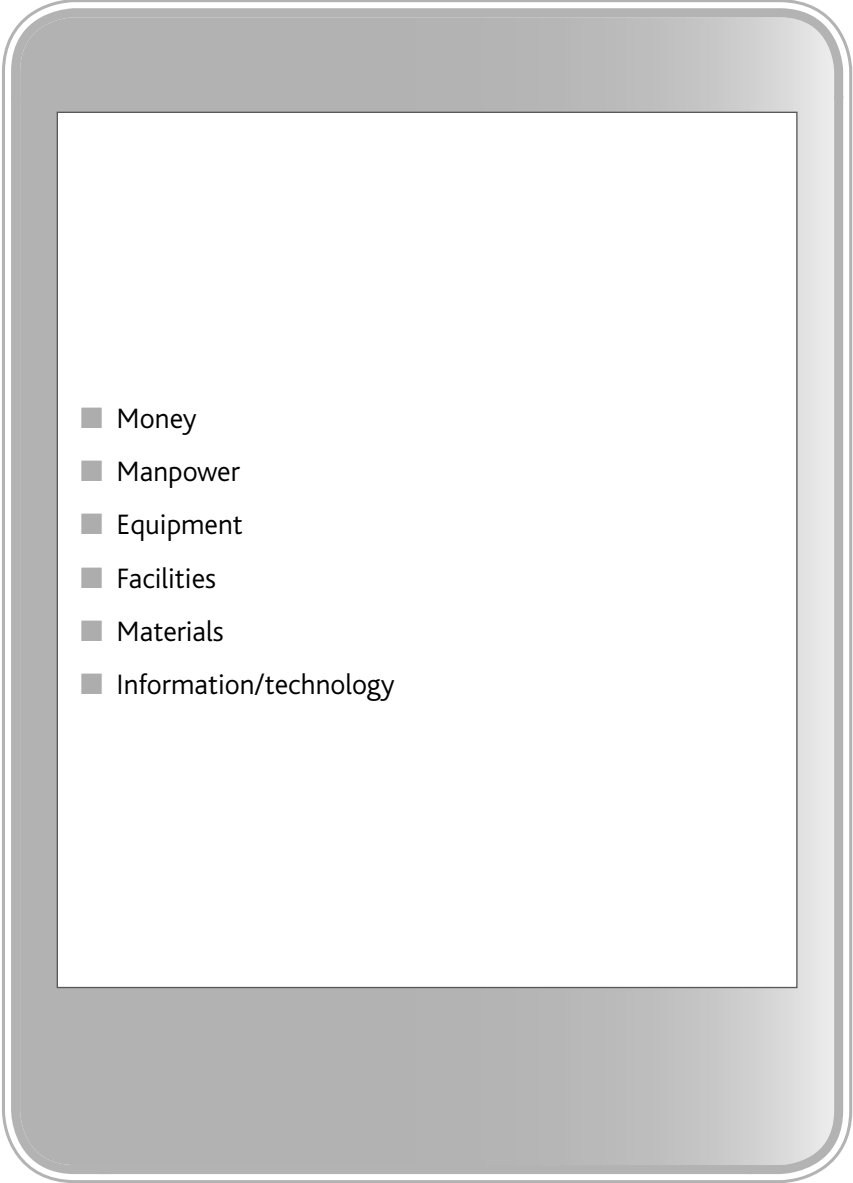
## THE TRIPLE CONSTRAINT



Project management is an attempt to improve efficiency and effectiveness in the use of resources by getting work to flow multidirectionally through an organization. Initially, this might seem easy to accomplish, but there are typically a number of constraints imposed on a project. The most common constraints are time, cost, and performance (also referred to as scope or quality) and are known as the triple constraint.

From an executive management perspective, the preceding illustration is the goal of project management, namely, meeting the triple constraints of time, cost, and performance while maintaining good customer relations. Unfortunately, because most projects have some unique characteristics, highly accurate estimates may not be possible and trade-offs among the triple constraint may be necessary. Executive management and functional management must be involved in almost all trade-off discussions to ensure that the final decision is made in the best interest of both the project and the company. Project managers may possess sufficient knowledge for some technical decision making, but may not have sufficient business or technical knowledge to adequately determine the best course of action to address interests of the company as well as the project.

## RESOURCES

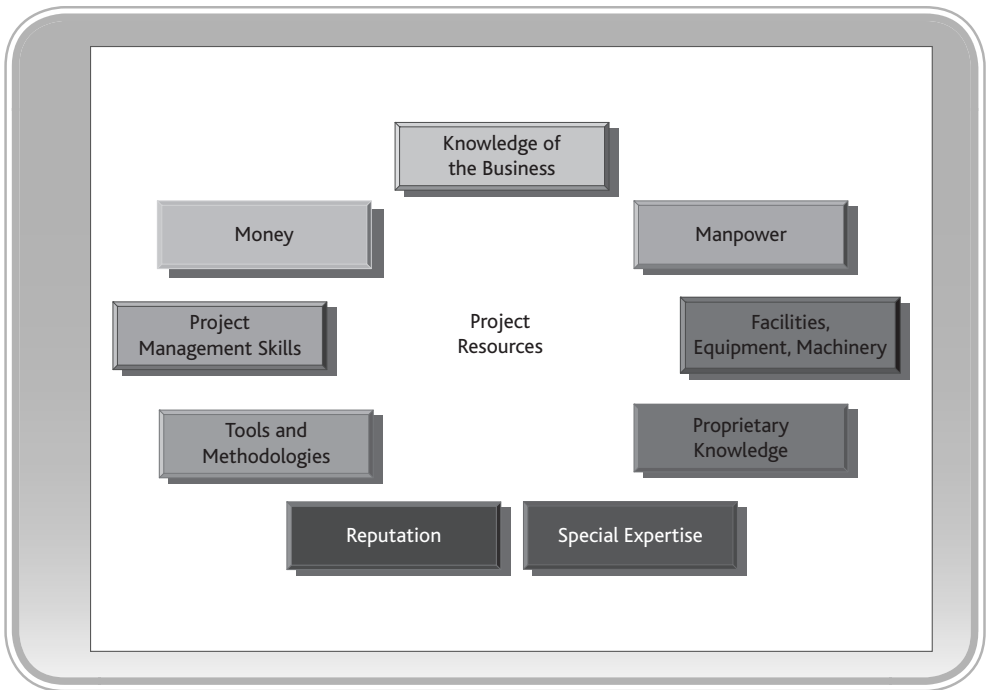
- 
- Money
  - Manpower
  - Equipment
  - Facilities
  - Materials
  - Information/technology

Here are some of the typical resources that are used when executing projects. Assuming that the project manager and functional manager are separate roles assigned to different people, the resources are generally administratively under the control of the functional managers. The project managers must therefore negotiate with the functional managers for some degree of control over these resources. It is not uncommon for project managers to have minimal or no direct control over project resources and must rely heavily on the functional managers for resource-related issues. The resources may be in a solid line type of reporting relationship to their functional manager and dotted line or indirect reporting to the project manager.

Some people argue that project managers have direct control over all budgets associated with a project. The truth of the matter is that project managers have the right to open and close charge numbers or cost accounts for a project. But once the charge numbers are opened, the team members performing the work and their respective functional managers are actually in control of how the money is being spent as long as the charge number limits are not exceeded.

There is an exception, however. If the project work must be performed at a remote location where the employees are physically removed from their functional area, the project manager may actually have direct control of the resources. This is quite common on construction projects.

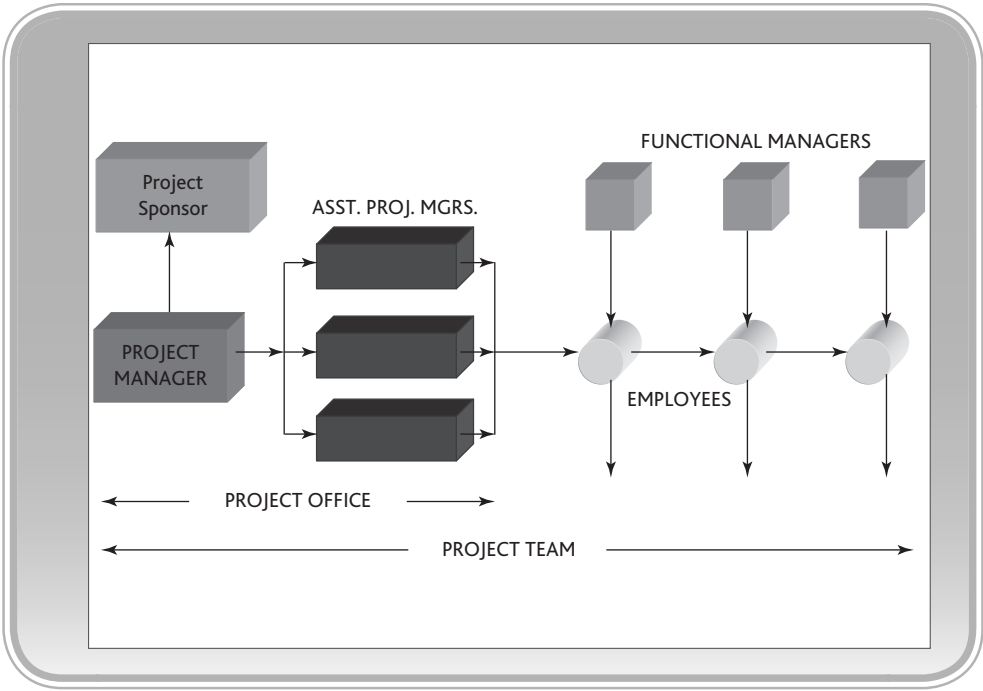
## TYPES OF PROJECT RESOURCES



The illustration shows the various project resources that project managers may or may not have under their direct control. Some of these resources require additional comment.

- *Money.* As stated previously, once budgets are established and charge numbers are opened, project managers focus more on project monitoring of the budget rather than management of the budget. Once the charge numbers are opened, the performer or workers and their respective line managers control how the budgets for each work package will be used.
- *Resources.* Resources are usually “owned” by the functional managers and may be directly controlled by the functional managers for the duration of the project. Also, even though the employees are assigned to a project team, functional managers may not authorize them to make decisions without review and approval of the functional managers.
- *Business knowledge.* Project managers are expected to make business decisions as well as project decisions. This is why executives must become involved with projects and interface with project managers to provide project managers with the necessary business information for decision making.

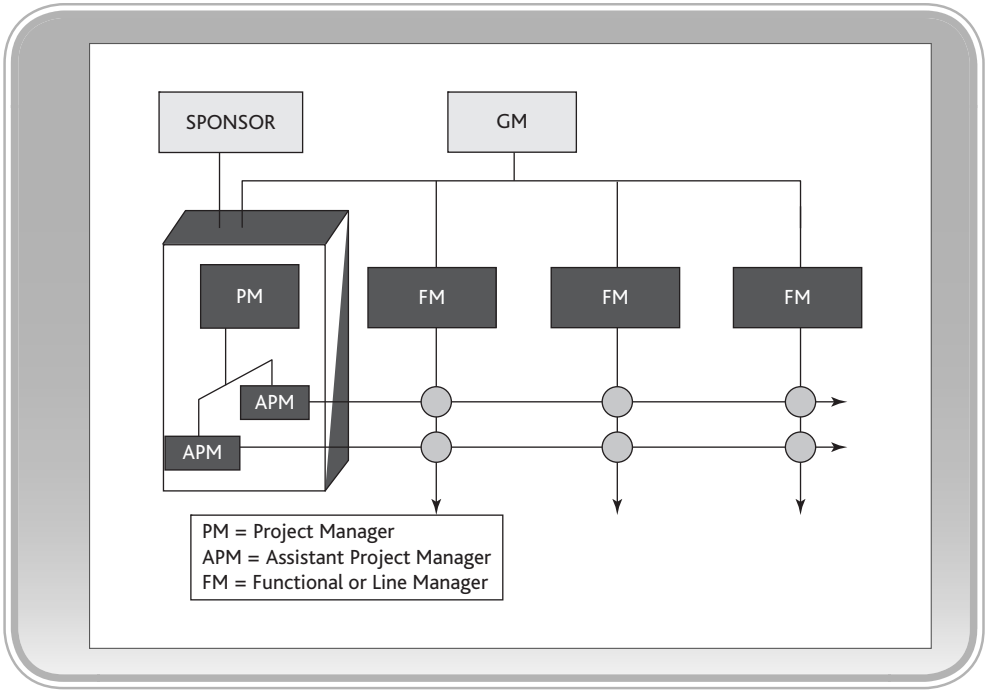
PROJECT ORGANIZATION



This illustration shows the major players or stakeholders associated with a project.

- The project manager is the person directing the overall project.
- The project manager reports to a project sponsor, who may be at the executive level of the company. The relationship between the project manager and the sponsor is usually a dotted-line relationship.
- On large projects, having assistant or deputy project managers is a common practice. For example, if the project has 10 engineers assigned, then 1 of the 10 engineers may be given the additional title of assistant project manager for engineering. The project manager will now work directly with the assistant project manager for engineering rather than with the 10 engineers.
- The employees are assigned by their respective functional managers and are usually in a dotted-line reporting relationship to the project manager and a solid-line relationship to their functional manager. The selection of an assistant project manager is a joint decision among the project and functional managers.
- For large projects, the project manager and assistant project managers may form and manage a project office.

**MULTIPLE BOSS REPORTING**



On the surface, it looks as though project management should be easy to perform within a company. Unfortunately, this is not the case. In the illustration on the previous page, the real problem occurs at the circles.

Each circle represents one or more functional employees that must report dotted line to the project manager and solid line to their functional or line manager. This is referred to as multiple boss reporting. The problems occur when the employees receive conflicting instructions from the project manager and functional manager. When this occurs, the employees usually respond to the individual who has the greatest influence on their performance review. This is, in most cases, the functional manager.

Project managers should work closely with functional managers with regard to providing direction to the employees. Placing employees in the middle of a conflict is not a very good idea. Some project managers prefer to provide the instructions to the functional managers first, who in turn will then relay the instructions to the functional employees. While this may incur some sort of small time delay, it does have the benefit of reducing conflicts, as well as keeping the functional managers informed as to what their employees are being asked to do.

## PROJECT-DRIVEN VERSUS NON-PROJECT-DRIVEN FIRMS

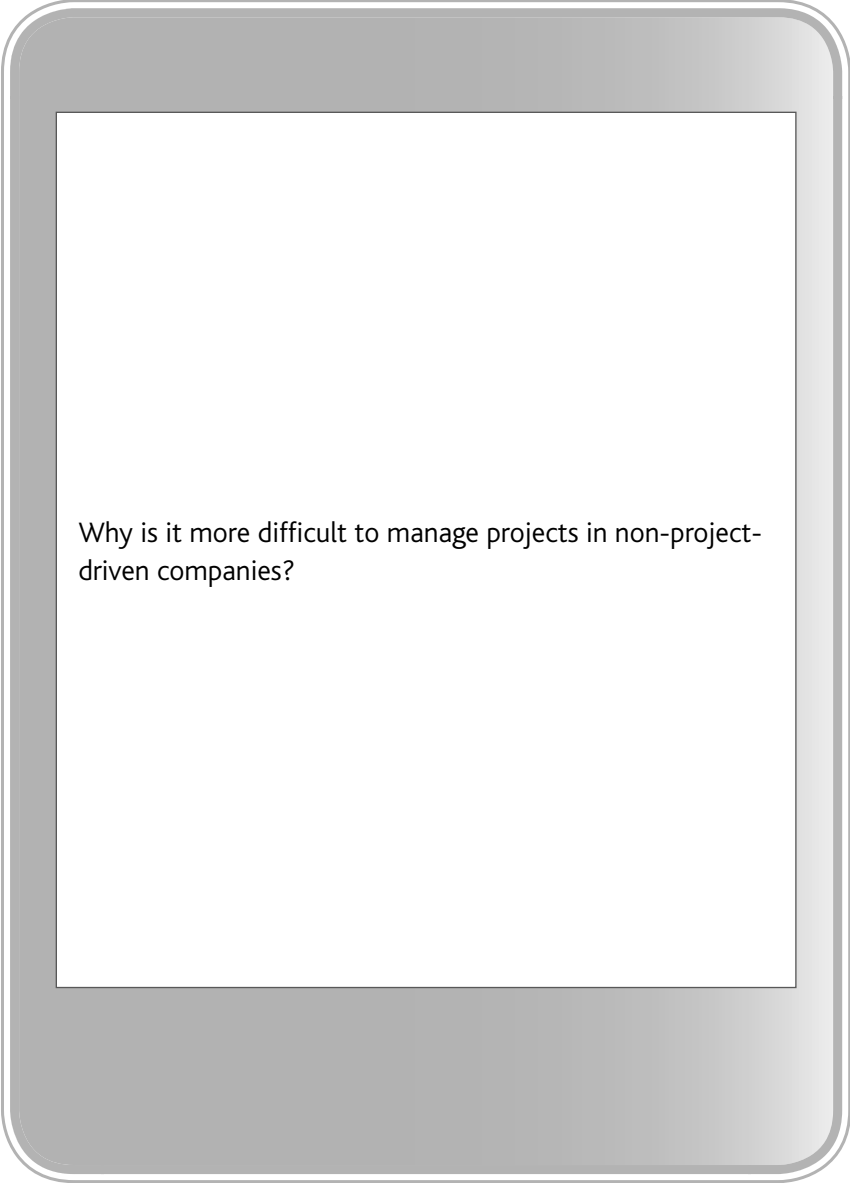
What are the differences between a project-driven and non-project-driven company?

In a project-driven or project-based company, corporate profitability is a result of projects rather than from functional areas. The survival of the company is based entirely on the profitability of projects. In such a case, the functional units exist to support the projects.

In a non-project-driven or non-project-based company, the profitability comes from the work performed in the functional units. The projects exist to support all of the functional units. During a functional crisis, resources may stop working on projects and return to their functional line. Project managers must understand that, in this situation, functional work has a higher priority than project work.

In project-driven companies, project management is regarded as a profession. In non-project-driven companies, it is more difficult to treat project management as a profession because employees associate their future and job security with the functional area rather than through project assignments. Project management may be treated as a part-time occupation in addition to an employee's normal functional responsibility.

## COMPLEXITIES IN NON-PROJECT-DRIVEN FIRMS



Why is it more difficult to manage projects in non-project-driven companies?

The difficulties in non-project-driven firms include:

- Projects may be few and far between.
- Not all projects have the same project management requirements and therefore they cannot be managed in a manner consistent with other projects. This difficulty results from poor understanding of project management and a reluctance of companies to invest in proper training.
- An enterprise project management methodology does not exist.
- Executives do not have sufficient time to manage projects themselves, yet refuse to delegate authority.
- Projects tend to be delayed because approvals most often follow the vertical chain of command. As a result, project work stays too long in functional departments.
- Because project staffing is done on a “local” basis, only a portion of the organization understands project management and can observe the system in action.
- There is a heavy dependency on the use of subcontractors and outside agencies for project management expertise.

## LEVELS OF REPORTING

Where should the project manager report?

There are both pros and cons to having the project manager report to a high level of management in the organizational hierarchy. The pros include:

- The project manager is charged with achieving results through the coordinated efforts of many functional units. The project manager should, therefore, report to the person who directs all those functions.
- The project manager must have adequate organizational status to do his or her job effectively, which is realized through the relationship with the executive manager.
- To obtain adequate and timely assistance for solving problems that inevitably appear in any important project, the project manager needs direct and specific access to an upper echelon of management.
- The customer, particularly in a competitive environment, will feel a greater sense of support and confidence if the project manager reports to a high organizational echelon.

A major potential problem with having the project manager report to a higher-level or executive manager is that it the relationship may alienate the functional managers on whom the project manager must rely for support.

## LOW-LEVEL REPORTING

Where should the project manager report?

Having project managers report to a low-level manager in the hierarchy may seem like the right idea, but it does create additional problems:

- It is organizationally and operationally inefficient to be engaged in too many projects, especially small ones, diverting senior executives from more vital concerns.
- Although giving a small project a position of high priority in the organization may create the illusion of executive attention, its actual result is to foster executive neglect of the project.
- Placing a junior project manager at too high a level in the organization may alienate senior functional executives who are relied on to provide support to the project manager.

It is sometimes difficult to find the appropriate position in the hierarchy for a project manager. In project-driven companies, project managers may be positioned at a higher level in the hierarchy than the functional managers, whereas in a non-project-driven company, the project managers are usually at the functional manager level or subordinate to the functional level.

## WHY USE PROJECT MANAGEMENT?



WHY USE PROJECT MANAGEMENT?

There are numerous benefits associated with using project management. These benefits affect all functional areas of the company and include:

- Identification of functional responsibilities to ensure that all activities are accounted for, regardless of personnel turnover
- Encouraging continuous improvement and documentation of best practices
- Identification of time limits and risks for scheduling
- Identification of a methodology for trade-off analysis
- Measurement of accomplishment compared to baseline plans
- Early identification of problems to enable appropriate corrective action
- Improved estimating capability for future planning
- Ability to determine when objectives cannot be met or will be exceeded

Later, we will discuss in more detail the benefits achieved from using project management.

## WHEN TO USE PROJECT MANAGEMENT

Are there specific situations when project management will work best?

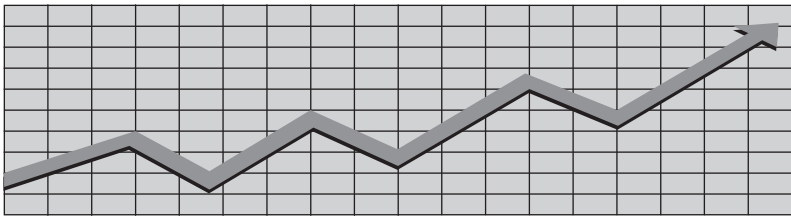
Are there appropriate times when project management appears to work best?

If the answer to any of the following five questions is “yes,” then we should consider using project management:

- Are the jobs complex?
- Are there dynamic environmental considerations?
- Are the constraints tight? (extremely limiting)
- Are there several activities and deliverables to be integrated?
- Are there several functional boundaries to be crossed?

The last two questions are often the most critical. When integration is required, project management becomes a necessity and should be utilized. While it is true that functional managers may be able to effectively manage those projects that remain entirely within their functional area, a number of problems may occur when integration requirements cut across multiple functional areas. One functional manager may not have the time or ability to provide the required effort to handle all of the integration issues that may be experienced across an organization while continuing to provide direction to the employees within their functional area.

## RELATIONSHIP



- Project management and productivity are related!

Over the years, companies have discovered that project management and productivity are related. However, the benefits of this relationship do not appear overnight. Some companies require up to five years or longer to develop and install processes and methodologies that will measure true productivity. Productivity may appear in a variety of forms, such as:

- Shortening project time frames
- Lowering of project costs
- Higher levels of quality with no accompanying cost increases
- Fewer meetings
- Fewer conflicts requiring senior management involvement
- Fewer forms, guidelines, checklists, and bureaucratic processes
- Better working relationships between project teams and functional managers
- Repeat business from a multitude of clients
- Higher customer satisfaction ratings

Some benefits can be realized quickly, but the majority of the benefits take time to fully develop.

## THE NEED FOR RESTRUCTURING

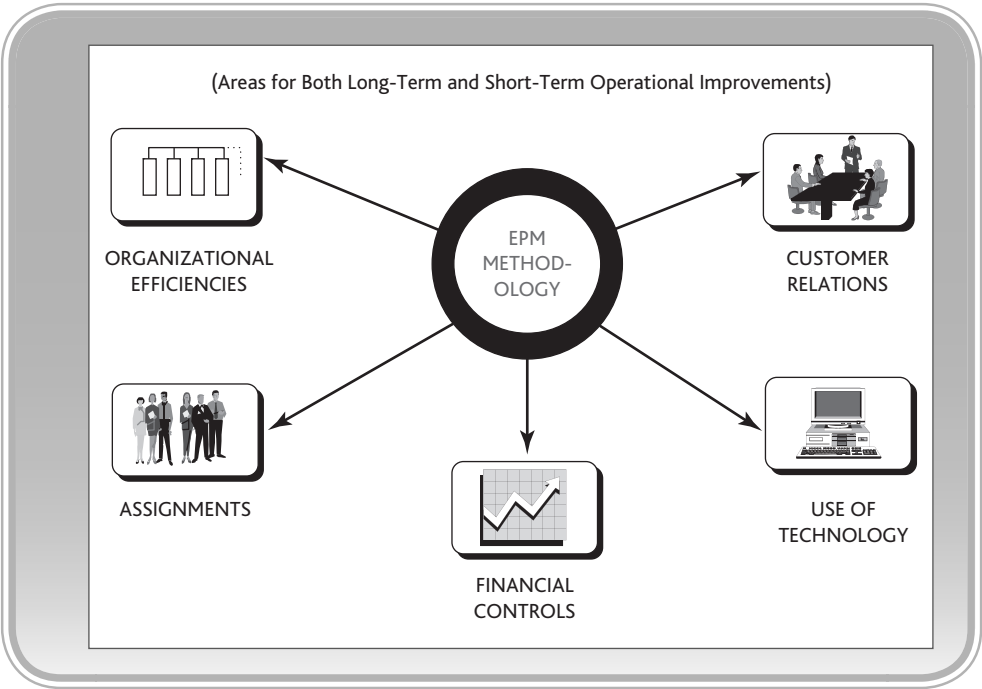
- Accomplish tasks that could not be effectively handled by the traditional structure
- Accomplish one-time activities with minimum disruption to routine business

If there is a downside risk to project management, it lies in the fact that projects cannot always be accomplished within the existing organizational structure. Organizational restructuring may be necessary, especially in companies that are project-driven. However, regardless of whether the company is project-driven or non-project-driven, there are issues that must be considered:

- Project priorities and competition for talent may interrupt the stability of the organization and interfere with its long-range interests by upsetting the normal business of the functional organization.
- Long-range planning may suffer as the company focuses more on meeting schedules and fulfilling the requirements of shorter-term, tactical projects.
- Shifting people from project to project may disrupt the training of new employees and specialists. This may hinder employee professional growth and development within their fields of specialization.

These issues can be overcome with an effective planning methodology.

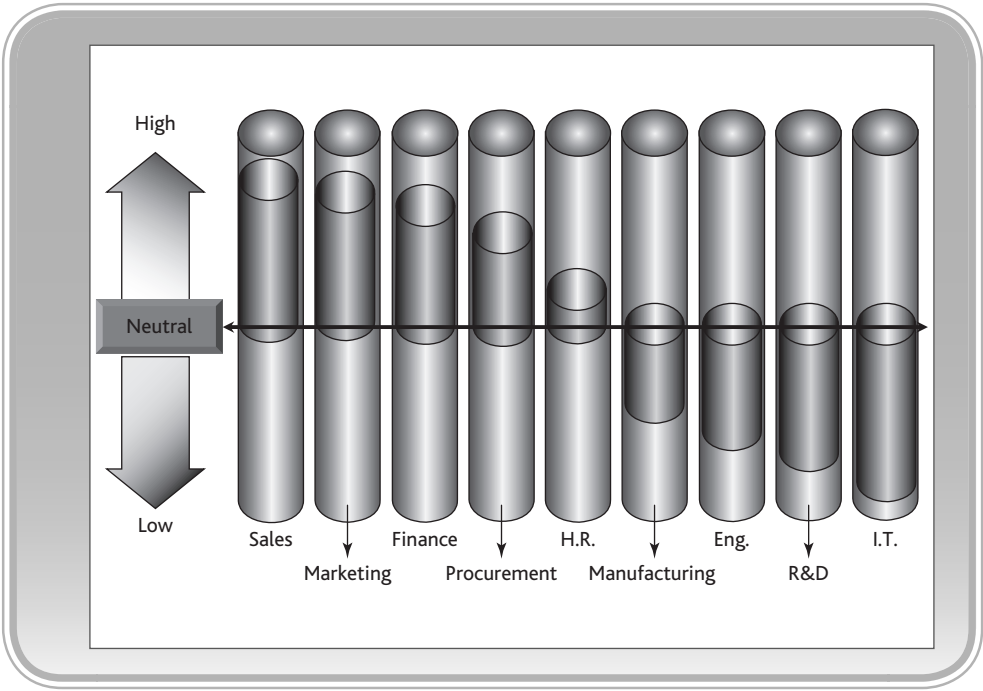
# IMPROVEMENT OPPORTUNITIES



The implementation of project management can provide significant opportunities for improvements in various parts of the company:

- *Organizational efficiencies.* Processes can be developed that make organizational work flow more efficiently and more effectively. This can improve profit margins.
- *Customer relations.* Project management allows organizations to work more closely with customers and possibly receive single-source contracts. It also increases our chances for follow-on work from the same client.
- *Assignments.* Assigning people to project teams becomes a more efficient process, and resource capacity planning models can be developed.
- *Financial controls.* Better financial controls will be developed and implemented, both horizontally and vertically. This may necessitate the implementation of an earned value measurement system.
- *Technology.* Technology usage is viewed from a company-wide basis rather from an individual department view.

RESISTANCE TO CHANGE



Functional managers and executives must realize that each functional area will form its own view of project management and some resistance to change can be expected. The reasons for resistance might be:

- Sales and marketing view project management as a risk to their traditional receipt of bonuses. They may not support project management for fear of having to share bonuses at successful project completion.
- Financial departments and functional units may feel threatened by the implementation of an earned value measurement system, which may be linked to efficiency reviews. This will require that they learn multiple accounting systems.
- Procurement departments may perceive a decentralization of procurement procedures to the project level.
- Human resources may not see the value of designing a whole new training curriculum for project management.
- Manufacturing, engineering, research and development (R&D), and information technology (IT) may support project management because they see the value and strategic necessity in using it.

