4.0 INTRODUCTION

Successful project management, regardless of the organizational structure, is only as good as the individuals and leaders who are managing the key functions. Project management is not a one-person operation; it requires a group of individuals dedicated to the achievement of a specific goal. Project management includes:

- A project manager
- An assistant project manager
- A project (home) office
- A project team
Generally, project office personnel are assigned full-time to the project and work out of the project office, whereas the project team members work out of the functional units and may spend only a small percentage of their time on the project. Normally, project office personnel report directly to the project manager, but they may still be solid to their line function just for administrative control. A project office usually is not required on small projects, and sometimes the project can be accomplished by just one person who may fill all of the project office positions.

Before the staffing function begins, five basic questions are usually considered:

- What are the requirements for an individual to become a successful project manager?
- Who should be a member of the project team?
- Who should be a member of the project office?
- What problems can occur during recruiting activities?
- What can happen downstream to cause the loss of key team members?

On the surface, these questions may not seem especially complex. But when we apply them to a project environment (which is by definition a “temporary” situation) where a constant stream of projects is necessary for corporate growth, the staffing problems become complex, especially if the organization is understaffed.

4.1 THE STAFFING ENVIRONMENT

To understand the problems that occur during staffing, we must first investigate the characteristics of project management, including the project environment, the project management process, and the project manager.

Two major kinds of problems are related to the project environment: personnel performance problems and personnel policy problems. Performance is difficult for many individuals in the project environment because it represents a change in the way of doing business. Individuals, regardless of how competent they are, find it difficult to adapt continually to a changing situation in which they report to multiple managers.

On the other hand, many individuals thrive on temporary assignments because it gives them a “chance for glory.” Unfortunately, some employees might consider the chance for glory more important than the project. For example, an employee may pay no attention to the instructions of the project manager and instead perform the task his own way. In this situation, the employee wants only to be recognized as an achiever and really does not care if the project is a success or failure, as long as he still has a functional home to return to where he will be identified as an achiever with good ideas.

The second major performance problem lies in the project–functional interface, where an individual suddenly finds himself reporting to two bosses, the functional manager and the project manager. If the functional manager and the project manager are in agreement about the work to be accomplished, then performance may not be hampered. But if conflicting directions are received, then the individual may let his performance suffer because of his com-
promising position. In this case, the employee will “bend” in the direction of the manager who controls his purse strings.

Personnel policy problems can create havoc in an organization, especially if the “grass is greener” in a project environment than in the functional environment. Functional organizations normally specify grades and salaries for employees. Project offices, on the other hand, have no such requirements and can promote and pay according to achievement. The difficulty here is that one can distinguish between employees in grades 7, 8, 9, 10, and 11 in a line organization, whereas for a project manager the distinction might appear only in the size of the project or the amount of responsibility. Bonuses are also easier to obtain in the project office but may create conflict and jealousy between the horizontal and vertical elements.

Because each project is different, the project management process allows each project to have its own policies, procedures, rules, and standards, provided they fall within broad company guidelines. Each project must be recognized as a project by top management so that the project manager has the delegated authority necessary to enforce the policies, procedures, rules, and standards.

Project management is successful only if the project manager and his team are totally dedicated to the successful completion of the project. This requires each team member of the project team and office to have a good understanding of the fundamental project requirements, which include:

- Customer liaison
- Project direction
- Project planning
- Project control
- Project evaluation
- Project reporting

Ultimately, the person with the greatest influence during the staffing phase is the project manager. The personal attributes and abilities of project managers will either attract or deter highly desirable individuals. Basic characteristics include:

- Honesty and integrity
- Understanding of personnel problems
- Understanding of project technology
- Business management competence
  - Management principles
  - Communications
- Alertness and quickness
- Versatility
- Energy and toughness
- Decision-making ability
- Ability to evaluate risk and uncertainty

Project managers must exhibit honesty and integrity to foster an atmosphere of trust. They should not make impossible promises, such as immediate promotions for everyone
if a follow-on contract is received. Also, on temporarily assigned activities, such as a project, managers cannot wait for personnel to iron out their own problems because time, cost, and performance requirements will not be satisfied.

Project managers should have both business management and technical expertise. They must understand the fundamental principles of management, especially those involving the rapid development of temporary communication channels. Project managers must understand the technical implications of a problem, since they are ultimately responsible for all decision-making. However, many good technically oriented managers have failed because they have become too involved with the technical side of the project rather than the management side. There are strong arguments for having a project manager who has more than just an understanding of the necessary technology.

Because a project has a relatively short time duration, decision-making must be rapid and effective. Managers must be alert and quick in their ability to perceive “red flags” that can eventually lead to serious problems. They must demonstrate their versatility and toughness in order to keep subordinates dedicated to goal accomplishment. Executives must realize that the project manager’s objectives during staffing are to:

- Acquire the best available assets and try to improve them
- Provide a good working environment for all personnel
- Make sure that all resources are applied effectively and efficiently so that all constraints are met, if possible

4.2 SELECTING THE PROJECT MANAGER:
AN EXECUTIVE DECISION

Probably the most difficult decision facing upper-level management is the selection of project managers. Some managers work best on long-duration projects where decision-making can be slow; others may thrive on short-duration projects that can result in a constant-pressure environment. A director was asked whom he would choose for a key project manager position—an individual who had been a project manager on previous programs in which there were severe problems and cost overruns, or a new aggressive individual who might have the capability to be a good project manager but had never had the opportunity. The director responded that he would go with the seasoned veteran assuming that the previous mistakes would not be made again. The argument here is that the project manager must learn from his own mistakes so they will not be made again. The new individual is apt to make the same mistakes the veteran made. However, this may limit career path opportunities for younger personnel. Stewart has commented on the importance of experience1:

Though the project manager’s previous experience is apt to have been confined to a single functional area of business, he must be able to function on the project as a kind of general

manager in miniature. He must not only keep track of what is happening but also play the crucial role of advocate for the project. Even for a seasoned manager, this task is not likely to be easy. Hence, it is important to assign an individual whose administrative abilities and skills in personal relations have been convincingly demonstrated under fire.

The selection process for project managers is not easy. Five basic questions must be considered:

- What are the internal and external sources?
- How do we select?
- How do we provide career development in project management?
- How can we develop project management skills?
- How do we evaluate project management performance?

Project management cannot succeed unless a good project manager is at the controls. It is far more likely that project managers will succeed if it is obvious to the subordinates that the general manager has appointed them. Usually, a brief memo to the line managers will suffice. The major responsibilities of the project manager include:

- To produce the end-item with the available resources and within the constraints of time, cost, and performance/technology
- To meet contractual profit objectives
- To make all required decisions whether they be for alternatives or termination
- To act as the customer (external) and upper-level and functional management (internal) communications focal point
- To “negotiate” with all functional disciplines for accomplishment of the necessary work packages within the constraints of time, cost, and performance/technology
- To resolve all conflicts

If these responsibilities were applied to the total organization, they might reflect the job description of the general manager. This analogy between project and general managers is one of the reasons why future general managers are asked to perform functions that are implied, rather than spelled out, in the job description. As an example, you are the project manager on a high-technology project. As the project winds down, an executive asks you to write a paper so that he can present it at a technical meeting in Tokyo. His name will appear first on the paper. Should this be a part of your job? As this author sees it, you really don’t have much of a choice.

In order for project managers to fulfill their responsibilities successfully, they are constantly required to demonstrate their skills in interface, resource, and planning and control management. These implicit responsibilities are shown below:

- Interface Management
  - Product interfaces
    - Performance of parts or subsections
    - Physical connection of parts or subsections
  - Project interfaces
Consider the following advertisement for a facilities planning and development project manager (adapted from *The New York Times*, January 2, 1972):

Personable, well-educated, literate individual with college degree in Engineering to work for a small firm. Long hours, no fringe benefits, no security, little chance for advancement are among the inducements offered. Job requires wide knowledge and experience in manufacturing, materials, construction techniques, economics, management and mathematics. Competence in the use of the spoken and written English is required. Must be willing to suffer personal indignities from clients, professional derision from peers in the more conventional jobs, and slanderous insults from colleagues.

Job involves frequent extended trips to inaccessible locations throughout the world, manual labor and extreme frustration from the lack of data on which to base decisions.

Applicant must be willing to risk personal and professional future on decisions based upon inadequate information and complete lack of control over acceptance of recommendations by clients. Responsibilities for the work are unclear and little or no guidance is offered. Authority commensurate with responsibility is not provided either by the firm or its clients.

Applicant should send resume, list of publications, references and other supporting documentation to...

Fortunately, these types of job descriptions are very rare today.

Finding the person with the right qualifications is not an easy task because the selection of project managers is based more on personal characteristics than on the job description. In Section 4.1 a brief outline of desired characteristics was presented. Russell Archibald defines a broader range of desired personal characteristics:


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Selecting the Project Manager: An Executive Decision

- Flexibility and adaptability
- Preference for significant initiative and leadership
- Aggressiveness, confidence, persuasiveness, verbal fluency
- Ambition, activity, forcefulness
- Effectiveness as a communicator and integrator
- Broad scope of personal interests
- Poise, enthusiasm, imagination, spontaneity
- Able to balance technical solutions with time, cost, and human factors
- Well organized and disciplined
- A generalist rather than a specialist
- Able and willing to devote most of his time to planning and controlling
- Able to identify problems
- Willing to make decisions
- Able to maintain proper balance in the use of time

This ideal project manager would probably have doctorates in engineering, business, and psychology, and experience with ten different companies in a variety of project office positions, and would be about twenty-five years old. Good project managers in industry today would probably be lucky to have 70 to 80 percent of these characteristics. The best project managers are willing and able to identify their own shortcomings and know when to ask for help.

Figures 4–1 and 4–2 show the basic knowledge and responsibilities that construction project managers should possess. The apprenticeship program for training construction project managers could easily be ten years.

The difficulty in staffing, especially for project managers or assistant project managers, is in determining what questions to ask during an interview to see if an individual has the necessary or desired characteristics. Individuals may be qualified to be promoted vertically but not horizontally. An individual with poor communication skills and interpersonal skills can be promoted to a line management slot because of his technical expertise, but this same individual is not qualified for project management promotion.

One of the best ways to interview is to read each element of the job description to the potential candidate. Many individuals want a career path in project management but are totally unaware of what the project manager’s duties are.

So far we have discussed the personal characteristics of the project manager. There are also job-related questions to consider, such as:

- Are feasibility and economic analyses necessary?
- Is complex technical expertise required? If so, is it within the individual’s capabilities?
- If the individual is lacking expertise, will there be sufficient backup strength in the line organizations?
- Is this the company’s or the individual’s first exposure to this type of project and/or client? If so, what are the risks to be considered?
- What is the priority for this project, and what are the risks?
- With whom must the project manager interface, both inside and outside the organization?
Most good project managers know how to perform feasibility studies and cost-benefit analyses. Sometimes these studies create organizational conflict. A major utility company begins each computer project with a feasibility study in which a cost-benefit analysis is performed. The project managers, all of whom report to a project management division, perform the study themselves without any direct functional support. The functional managers argue that the results are grossly inaccurate because the functional experts are not involved. The project managers, on the other hand, argue that they never have sufficient time or money to perform a complete analysis. Some companies resolve this by having a special group perform these studies.

Most companies would prefer to find project managers from within. Unfortunately, this is easier said than done. The following remarks by Robert Fluor illustrate this point:

On-the-job training is probably the most important aspect in the development of a project manager. This includes assignments to progressively more responsible positions in engineering and construction management and project management. It also includes rotational assignments in several engineering department disciplines, in construction, procurement, cost and scheduling, contract administration, and others. . . . We find there are great advantages to developing our project managers from within the company. There are good reasons for this:

They know the corporate organization, policies, procedures, and the key people. This allows them to give us quality performance quicker.

They have an established performance record which allows us to place them at the maximum level of responsibility and authority.

Clients prefer a proven track record within the project manager’s present organization.

There are also good reasons for recruiting from outside the company. A new project manager hired from the outside would be less likely to have strong informal ties to any one line organization and thus could be impartial. Some companies further require that the individual spend an apprenticeship period of twelve to eighteen months in a line organization to find out how the company functions, to become acquainted with the people, and to understand the company’s policies and procedures.

One of the most important but often least understood characteristics of good project managers is the ability to know their own strengths and weaknesses and those of their employees. Managers must understand that in order for employees to perform efficiently:

- They must know what they are supposed to do.
- They must have a clear understanding of authority and its limits.
- They must know what their relationship with other people is.
- They should know what constitutes a job well done in terms of specific results.
- They should know where and when they are falling short.
4.3 SKILL REQUIREMENTS FOR PROGRAM MANAGERS

Managing complex programs represents a challenge requiring skills in team building, leadership, conflict resolution, technical expertise, planning, organization, entrepreneurship, administration, management support, and the allocation of resources. This section examines these skills relative to program management effectiveness. A key factor to good program performance is the program manager’s ability to integrate personnel from many disciplines into an effective work team.

To get results, the program manager must relate to (1) the people to be managed, (2) the task to be done, (3) the tools available, (4) the organizational structure, and (5) the organizational environment, including the customer community.

With an understanding of the interaction of corporate organization and behavior elements, the manager can build an environment conducive to the working team’s needs. The internal and external forces that impinge on the organization of the project must be reconciled to mutual goals. Thus the program manager must be both socially and technically aware to understand how the organization functions and how these functions will affect the program organization of the particular job to be done. In addition, the program manager must understand the culture and value system of the organization he is working with. Effective program management is directly related to proficiency in these ten skills:

- Team building
- Leadership
- Conflict resolution
- Technical expertise
- Planning
- Organization
- Entrepreneurship
- Administration
- Management support
- Resource allocation

It is important that the personal management style underlying these skills facilitate the integration of multidisciplinary program resources for synergistic operation. The days of the manager who gets by with technical expertise alone or pure administrative skills are gone.

Team-Building Skills

Building the program team is one of the prime responsibilities of the program manager. Team building involves a whole spectrum of management skills required to identify, commit, and integrate the various task groups from the traditional functional organization into a single program management system.
To be effective, the program manager must provide an atmosphere conducive to teamwork. He must nurture a climate with the following characteristics:

- Team members committed to the program
- Good interpersonal relations and team spirit
- The necessary expertise and resources
- Clearly defined goals and program objectives
- Involved and supportive top management
- Good program leadership
- Open communication among team members and support organizations
- A low degree of detrimental interpersonal and intergroup conflict

Three major considerations are involved in all of the above factors: (1) effective communications, (2) sincere interest in the professional growth of team members, and (3) commitment to the project.

**Leadership Skills**

A prerequisite for program success is the program manager’s ability to lead the team within a relatively unstructured environment. It involves dealing effectively with managers and supporting personnel across functional lines and the ability to collect and filter relevant data for decision-making in a dynamic environment. It involves the ability to integrate individual demands, requirements, and limitations into decisions and to resolve intergroup conflicts.

As with a general manager, quality leadership depends heavily on the program manager’s personal experience and credibility within the organization. An effective management style might be characterized this way:

- Clear project leadership and direction
- Assistance in problem-solving
- Facilitating the integration of new members into the team
- Ability to handle interpersonal conflict
- Facilitating group decisions
- Capability to plan and elicit commitments
- Ability to communicate clearly
- Presentation of the team to higher management
- Ability to balance technical solutions against economic and human factors

The personal traits desirable and supportive of the above skills are:

- Project management experience
- Flexibility and change orientation
- Innovative thinking
- Initiative and enthusiasm
- Charisma and persuasiveness
- Organization and discipline
Conflict is fundamental to complex task management. Understanding the determinants of conflicts is important to the program manager’s ability to deal with conflicts effectively. When conflict becomes dysfunctional, it often results in poor program decision-making, lengthy delays over issues, and a disruption of the team’s efforts, all negative influences to program performance. However, conflict can be beneficial when it produces involvement and new information and enhances the competitive spirit.

To successfully resolve conflict and improve overall program performance, program managers must:

- Understand interaction of the organizational and behavioral elements in order to build an environment conducive to their team’s motivational needs. This will enhance active participation and minimize unproductive conflict.
- Communicate effectively with all organizational levels regarding both project objectives and decisions. Regularly scheduled status review meetings can be an important communication vehicle.
- Recognize the determinants of conflict and their timing in the project life cycle. Effective project planning, contingency planning, securing of commitments, and involving top management can help to avoid or minimize many conflicts before they impede project performance.

The accomplished manager needs a “sixth sense” to indicate when conflict is desirable, what kind of conflict will be useful, and how much conflict is optimal for a given situation. In the final analysis, he has the sole responsibility for his program and how conflict will contribute to its success or failure.

Technical Skills

The program manager rarely has all the technical, administrative, and marketing expertise needed to direct the program single-handedly. It is essential, however, for the program manager to understand the technology, the markets, and the environment of the business. Without this understanding, the consequences of local decisions on the total program, the potential growth ramifications, and relationships to other business opportunities cannot be foreseen by the manager. Further technical expertise is necessary to evaluate technical concepts and solutions, to communicate effectively in technical terms with the project team, and to assess risks and make trade-offs between cost, schedule, and technical issues. This is why in complex problem-solving situations so many project managers must have an engineering background.

Technical expertise is composed of an understanding of the:

- Technology involved
- Engineering tools and techniques employed
- Specific markets, their customers, and requirements
- Product applications
- Technological trends and evolutions
- Relationship among supporting technologies
- People who are part of the technical community
The technical expertise required for effective management of engineering programs is normally developed through progressive growth in engineering or supportive project assignments in a specific technology area. Frequently, the project begins with an exploratory phase leading into a proposal. This is normally an excellent testing ground for the future program manager. It also allows top management to judge the new candidate’s capacity for managing the technological innovations and integration of solutions.

Planning Skills

Planning skills are helpful for any undertaking; they are absolutely essential for the successful management of large complex programs. The project plan is the road map that defines how to get from the start to the final results.

Program planning is an ongoing activity at all organizational levels. However, the preparation of a project summary plan, prior to project start, is the responsibility of the program manager. Effective project planning requires particular skills far beyond writing a document with schedules and budgets. It requires communication and information processing skills to define the actual resource requirements and administrative support necessary. It requires the ability to negotiate the necessary resources and commitments from key personnel in various support organizations with little or no formal authority.

Effective planning requires skills in the areas of:

- Information processing
- Communication
- Resource negotiations
- Securing commitments
- Incremental and modular planning
- Assuring measurable milestones
- Facilitating top management involvement

In addition, the program manager must assure that the plan remains a viable document. Changes in project scope and depth are inevitable. The plan should reflect necessary changes through formal revisions and should be the guiding document throughout the life cycle of the program. An obsolete or irrelevant plan is useless.

Finally, program managers need to be aware that planning can be overdone. If not controlled, planning can become an end in itself and a poor substitute for innovative work. It is the responsibility of the program manager to build flexibility into the plan and police it against misuse.

Organizational Skills

The program manager must be a social architect; that is, he must understand how the organization works and how to work with the organization. Organizational skills are particularly important during project formation and startup when the program manager is integrating people from many different disciplines into an effective work team. It requires defining the reporting relationships, responsibilities, lines of control, and information needs. A good program plan and a task matrix are useful organizational tools. In addition, the organizational effort is facilitated by clearly
defined program objectives, open communication channels, good program leadership, and senior management support.

Entrepreneurial Skills

The program manager also needs a general management perspective. For example, economic considerations affect the organization’s financial performance, but objectives often are much broader than profits. Customer satisfaction, future growth, cultivation of related market activities, and minimum organizational disruptions of other programs might be equally important goals. The effective program manager is concerned with all these issues.

Entrepreneurial skills are developed through actual experience. However, formal MBA-type training, special seminars, and cross-functional training programs can help to develop the entrepreneurial skills needed by program managers.

Administrative Skills

Administrative skills are essential. The program manager must be experienced in planning, staffing, budgeting, scheduling, and other control techniques. In dealing with technical personnel, the problem is seldom to make people understand administrative techniques such as budgeting and scheduling, but to impress on them that costs and schedules are just as important as elegant technical solutions.

Particularly on larger programs, managers rarely have all the administrative skills required. While it is important that program managers understand the company’s operating procedures and available tools, it is often necessary for the program manager to free himself from administrative details regardless of his ability to handle them. He has to delegate considerable administrative tasks to support groups or hire a project administrator.

Some helpful tools for the manager in the administration of his program include: (1) the meeting, (2) the report, (3) the review, and (4) budget and schedule controls. Program managers must be thoroughly familiar with these available tools and know how to use them effectively.

Management Support Building Skills

The program manager is surrounded by a myriad of organizations that either support him or control his activities. An understanding of these interfaces is important to program managers as it enhances their ability to build favorable relationships with senior management. Project organizations are shared-power systems with personnel of many diverse interests and “ways of doing things.” Only a strong leader backed by senior management can prevent the development of unfavorable biases.

Four key variables influence the project manager’s ability to create favorable relationships with senior management: (1) his ongoing credibility, (2) the visibility of his program, (3) the priority of his program relative to other organizational undertakings, and (4) his own accessibility.

Resource Allocation Skills

A program organization has many bosses. Functional lines often shield support organizations from direct financial control by the project office. Once a task has been authorized, it is often impossible to control the personnel assignments,
priorities, and indirect manpower costs. In addition, profit accountability is difficult owing to the interdependencies of various support departments and the often changing work scope and contents.

Effective and detailed program planning may facilitate commitment and reinforce control. Part of the plan is the “Statement of Work,” which establishes a basis for resource allocation. It is also important to work out specific agreements with all key contributors and their superiors on the tasks to be performed and the associated budgets and schedules. Measurable milestones are not only important for hardware components, but also for the “invisible” program components such as systems and software tasks. Ideally, these commitments on specs, schedules, and budgets should be established through involvement by key personnel in the early phases of project formation, such as the proposal phase. This is the time when requirements are still flexible, and trade-offs among performance, schedule, and budget parameters are possible. Further, this is normally the time when the competitive spirit among potential contributors is highest, often leading to a more cohesive and challenging work plan.

4.4 SPECIAL CASES IN PROJECT MANAGER SELECTION

Thus far we have assumed that the project is large enough for a full-time project manager to be appointed. This is not always the case. There are four major problem areas in staffing projects:

- Part-time versus full-time assignments
- Several projects assigned to one project manager
- Projects assigned to functional managers
- The project manager role retained by the general manager

The first problem is generally related to the size of the project. If the project is small (in time duration or cost), a part-time project manager may be selected. Many executives have fallen into the trap of letting line personnel act as part-time project managers while still performing line functions. If the employee has a conflict between what is best for the project and what is best for his line organization, the project will suffer. It is only natural that the employee will favor the place the salary increases come from.

It is a common practice for one project manager to control several projects, especially if they are either related or similar. Problems come about when the projects have drastically different priorities. The low-priority efforts will be neglected.

If the project is a high-technology effort that requires specialization and can be performed by one department, then it is not unusual for the line manager to take on a dual role and act as project manager as well. This can be difficult to do, especially if the project manager is required to establish the priorities for the work under his supervision. The line manager may keep the best resources for the project, regardless of the priority. Then that project will be a success at the expense of every other project he must supply resources to.

Probably the worst situation is that in which an executive fills the role of project manager for a particular effort. The executive may not have the time necessary for total dedication to
the achievement of the project. He cannot make effective decisions as a project manager while still discharging normal duties. Additionally, the executive may hoard the best resources for his project.

4.5 SELECTING THE WRONG PROJECT MANAGER

Even though executives know the personal characteristics and traits that project managers should possess, and even though job descriptions are often clearly defined, management may still select the wrong person because they base their decision on the following criteria.

**Maturity**

Some executives consider gray hair to be a sure indication of maturity, but this is not the type of maturity needed for project management. Maturity in project management generally comes from exposure to several types of projects in a variety of project office positions. In aerospace and defense, it is possible for a project manager to manage the same type of project for ten years or more. When placed on a new project, the individual may try to force personnel and project requirements to adhere to the same policies and procedures that existed on the ten-year project. The project manager may know only one way of managing projects.

**Hard-Nosed Tactics**

Applying hard-nosed tactics to subordinates can be very demoralizing. Project managers must give people sufficient freedom to get the job done, without providing continuous supervision and direction. A line employee who is given “freedom” by his line manager but suddenly finds himself closely supervised by the project manager will be very unhappy.

Line managers, because of their ability to control an employee’s salary, need only one leadership style and can force the employees to adapt. The project manager, on the other hand, cannot control salaries and must have a wide variety of leadership styles. The project manager must adapt a leadership style to the project employees, whereas the reverse is true in the line organization.

**Availability**

Executives should not assign individuals as project managers simply because of availability. People have a tendency to cringe when you suggest that project managers be switched halfway through a project. For example, manager X is halfway through his project. Manager Y is waiting for an assignment. A new project comes up, and the executive switches managers X and Y. There are several reasons for this. The most important phase of a project is planning, and, if it is accomplished correctly, the project could conceivably run itself. Therefore, manager Y should be able to handle manager X’s project.

There are several other reasons why this switch may be necessary. The new project may have a higher priority and require a more experienced manager. Second, not all project managers are equal, especially when it comes to planning. When an executive finds
a project manager who demonstrates extraordinary talents at planning, there is a natural tendency for the executive to want this project manager to plan all projects.

**Technical Expertise**

Executives quite often promote technical line managers without realizing the consequences. Technical specialists may not be able to divorce themselves from the technical side of the house and become project managers rather than project doers. There are also strong reasons to promote technical specialists to project managers. These people often:

- Have better relationships with fellow researchers
- Can prevent duplication of effort
- Can foster teamwork
- Have progressed up through the technical ranks
- Are knowledgeable in many technical fields
- Understand the meaning of profitability and general management philosophy
- Are interested in training and teaching
- Understand how to work with perfectionists

As described by Taylor and Watling⁴:

> It is often the case, therefore, that the Project Manager is more noted for his management technique expertise, his ability to “get on with people” than for his sheer technical prowess. However, it can be dangerous to minimize this latter talent when choosing Project Managers dependent upon project type and size. The Project Manager should preferably be an expert either in the field of the project task or a subject allied to it.

Promoting an employee to project management because of his technical expertise may be acceptable if, and only if, the project requires this expertise and technical direction, as in R&D efforts. For projects in which a “generalist” is acceptable as a project manager, there may be a great danger in assigning highly technical personnel. According to Wilemon and Cicero⁵:

- The greater the project manager’s technical expertise, the higher the propensity that he will overly involve himself in the technical details of the project.
- The greater the project manager’s difficulty in delegating technical task responsibilities, the more likely it is that he will overinvolve himself in the technical details of the project. (Depending upon his expertise to do so.)
- The greater the project manager’s interest in the technical details of the project, the more likely it is that he will defend the project manager’s role as one of a technical specialist.
- The lower the project manager’s technical expertise, the more likely it is that he will overstress the nontechnical project functions (administrative functions).

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Customer Orientation

Executives quite often place individuals as project managers simply to satisfy a customer request. Being able to communicate with the customer does not guarantee project success, however. If the choice of project manager is simply a concession to the customer, then the executive must insist on providing a strong supporting team.

New Exposure

Executives run the risk of project failure if an individual is appointed project manager simply to gain exposure to project management. An executive of a utility company wanted to rotate his line personnel into project management for twelve to eighteen months and then return them to the line organization where they would be more well-rounded individuals and better understand the working relationship between project management and line management. There are two major problems with this. First, the individual may become technically obsolete after eighteen months in project management. Second, and more important, individuals who get a taste of project management will generally not want to return to the line organization.

Company Exposure

The mere fact that individuals have worked in a variety of divisions does not guarantee that they will make good project managers. Their working in a variety of divisions may indicate that they couldn’t hold any one job. In that case, they have reached their true level of incompetency, and putting them into project management will only maximize the damage they can do to the company. Some executives contend that the best way to train a project manager is by rotation through the various func-

TABLE 4–1. METHODS AND TECHNIQUES FOR DEVELOPING PROJECT MANAGERS

| I. Experiential training/on-the-job |
| Working with experienced professional leader |
| Working with project team member |
| Assigning a variety of project management responsibilities, consecutively |
| Job rotation |
| Formal on-the-job training |
| Supporting multifunctional activities |
| Customer liaison activities |
| II. Conceptual training/schooling |
| Courses, seminars, workshops |
| Simulations, games, cases |
| Group exercises |
| Hands-on exercises in using project management techniques |
| Professional meetings |
| Conventions, symposia |
| Readings, books, trade journals, professional magazines |
| III. Organizational development |
| Formally established and recognized project management function |
| Proper project organization |
| Project support systems |
| Project charter |
| Project management directives, policies, and procedures |
tional disciplines for two weeks to a month in each organization. Other executives maintain that this is useless because the individual cannot learn anything in so short a period of time.

Tables 4–1 and 4–2 identify current thinking on methods for training project managers.

Finally, there are three special points to consider:

- Individuals should not be promoted to project management simply because they are at the top of their pay grade.
- Project managers should be promoted and paid based on performance, not on the number of people supervised.
- It is not necessary for the project manager to be the highest ranking or salaried individual on the project team with the rationale that sufficient “clout” is needed.

### 4.6 NEXT GENERATION PROJECT MANAGERS

The skills needed to be an effective, twenty-first century project manager have changed from those needed during the 1980s. Historically, only engineers were given the opportunity to become project managers. The belief was that the project manager had to have a command of technology in order to make all of the technical decisions. As projects became larger and more complex, it became obvious that project managers might need simply an understanding rather than a command of technology. The true technical expertise would reside with the line managers, except for special situations such as R&D project management.

As project management began to grow and mature, the project manager was converted from a technical manager to a business manager. The primary skills needed to be an effective project manager in the twenty-first century are:

- Knowledge of the business
- Risk management
- Integration skills

The critical skill is risk management. However, to perform risk management effectively, a sound knowledge of the business is required. Figure 4-3 shows the changes in project management skills needed between 1985 and 2003.
As projects become larger, the complexities of integration management become more pronounced. Figure 4–4 illustrates the importance of integration management. In 1985, project managers spent most of their time planning and replanning with their team. This was necessary because the project manager was the technical expert. Today, line managers are the technical experts and perform the majority of the planning and replanning within their line. The project manager’s efforts are now heavily oriented toward integration of the

![Figure 4-3](image1.png)

**FIGURE 4–3.** Project management skills.

![Figure 4-4](image2.png)

**FIGURE 4–4.** How do project managers spend their time?
function plans into a total project plan. Some people contend that, with the increased risks and complexities of integration management, the project manager of the future will become an expert in damage control.

4.7 DUTIES AND JOB DESCRIPTIONS

Since projects, environments, and organizations differ from company to company as well as project to project, it is not unusual for companies to struggle to provide reasonable job descriptions of the project manager and associated personnel. Below is a simple list identifying the duties of a project manager in the construction industry:

- **Planning**
  - Become completely familiar with all contract documents
  - Develop the basic plan for executing and controlling the project
  - Direct the preparation of project procedures
  - Direct the preparation of the project budget
  - Direct the preparation of the project schedule
  - Direct the preparation of basic project design criteria and general specifications
  - Direct the preparation of the plan for organizing, executing, and controlling field construction activities
  - Review plans and procedures periodically and institute changes if necessary

- **Organizing**
  - Develop organization chart for project
  - Review project position descriptions, outlining duties, responsibilities, and restrictions for key project supervisors
  - Participate in the selection of key project supervisors
  - Develop project manpower requirements
  - Continually review project organization and recommend changes in organizational structure and personnel, if necessary

- **Directing**
  - Direct all work on the project that is required to meet contract obligations
  - Develop and maintain a system for decision-making within the project team whereby decisions are made at the proper level
  - Promote the growth of key project supervisors
  - Establish objectives for project manager and performance goals for key project supervisors
  - Foster and develop a spirit of project team effort
  - Assist in resolution of differences or problems between departments or groups on assigned projects
  - Anticipate and avoid or minimize potential problems by maintaining current knowledge of overall project status

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6. Source unknown.
- Develop clear written strategy guidelines for all major problems with clear definitions of responsibilities and restraints
- Controlling
  - Monitor project activities for compliance with company purpose and philosophy and general corporate policies
  - Interpret, communicate, and require compliance with the contract, the approved plan, project procedures, and directives of the client
  - Maintain personal control of adherence to contract warranty and guarantee provisions
  - Closely monitor project activities for conformity to contract scope provisions. Establish change notice procedure to evaluate and communicate scope changes
  - See that the plans for controlling and reporting on costs, schedule, and quality are effectively utilized
  - Maintain effective communications with the client and all groups performing project work

A more detailed job description of a construction project manager (for a utility company) appears below:

DUTIES
Under minimum supervision establishes the priorities for and directs the efforts of personnel (including their consultants or contractors) involved or to be involved on project controlled tasks to provide required achievement of an integrated approved set of technical, manpower, cost, and schedule requirements.

1. Directs the development of initial and revised detailed task descriptions and forecasts of their associated technical, manpower, cost, and schedule requirements for tasks assigned to the Division.
2. Directs the regular integration of initial and revised task forecasts into Divisional technical, manpower, cost, and schedule reports and initiates the approval cycle for the reports.
3. Reviews conflicting inter- and extra-divisional task recommendations or actions that may occur from initial task description and forecast development until final task completion and directs uniform methods for their resolution.
4. Evaluates available and planned additions to Division manpower resources, including their tasks applications, against integrated technical and manpower reports and initiates actions to assure that Division manpower resources needs are met by the most economical mix of available qualified consultant and contractor personnel.
5. Evaluates Divisional cost and schedule reports in light of new tasks and changes in existing tasks and initiates actions to assure that increases or decreases in task cost and schedule are acceptable and are appropriately approved.
6. Prioritizes, adjusts, and directs the efforts of Division personnel (including their consultants and contractors) resource allocations as necessary to both assure the scheduled achievement of state and federal regulatory commitments and maintain Divisional adherence to integrated manpower, cost, and schedule reports.
7. Regularly reports the results of Divisional manpower, cost, and schedule evaluations to higher management.
8. Regularly directs the development and issue of individual task and integrated Project programs reports.
9. Recommends new or revised Division strategies, goals, and objectives in light of anticipated long-term manpower and budget needs.
10. Directly supervises project personnel in the regular preparation and issue of individual task descriptions and their associated forecasts, integrated Division manpower, cost, and schedule reports, and both task and Project progress reports.
11. Establishes basic organizational and personnel qualification requirements for Division (including their consultants or contractors) performance on tasks.
12. Establishes the requirements for, directs the development of, and approves control programs to standardize methods used for controlling similar types of activities in the Project and in other Division Departments.
13. Establishes the requirements for, directs the development of, and approves administrative and technical training programs for Divisional personnel.
14. Approves recommendations for the placement of services or material purchase orders by Division personnel and assures that the cost and schedule data associated with such orders is consistent with approved integrated cost and schedule reports.
15. Promotes harmonious relations among Division organizations involved with Project tasks.
16. Exercises other duties related to Divisional project controls as assigned by the project manager.

QUALIFICATIONS

1. A Bachelor of Science Degree in Engineering or a Business Degree with a minor in Engineering or Science from an accredited four (4) year college or university.
2. a) (For Engineering Graduate) Ten (10) or more years of Engineering and Construction experience including a minimum of five (5) years of supervisory experience and two (2) years of management and electric utility experience.
b) (For Business Graduate) Ten (10) or more years of management experience including a minimum of five (5) years of supervisory experience in an engineering and construction related management area and two (2) years of experience as the manager or assistant manager of major engineering and construction related projects and two (2) recent years of electric utility experience.
3. Working knowledge of state and federal regulations and requirements that apply to major design and construction projects such as fossil and nuclear power stations.
4. Demonstrated ability to develop high level management control programs.
5. Experience related to computer processing of cost and schedule information.
6. Registered Professional Engineer and membership in appropriate management and technical societies is desirable (but not necessary).
7. At least four (4) years of experience as a staff management member in an operating nuclear power station or in an engineering support on- or off-site capacity.
8. Detailed knowledge of federal licensing requirement for nuclear power stations.
9. Reasonably effective public speaker.

7. Qualifications 7 through 9 apply only for Nuclear Project Directors.
## TABLE 4–3. PROJECT MANAGEMENT POSITIONS AND RESPONSIBILITIES

<table>
<thead>
<tr>
<th>Project Management Position</th>
<th>Typical Responsibility</th>
<th>Skill Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Administrator</td>
<td>Coordinating and integrating of subsystem tasks. Assisting in determining technical and</td>
<td>Planning, Coordinating, Analyzing, Understanding the</td>
</tr>
<tr>
<td>Project Coordinator</td>
<td>manpower requirements, schedules, and budgets. Measuring and analyzing project</td>
<td>organization</td>
</tr>
<tr>
<td>Technical Assistant</td>
<td>performance regarding technical progress, schedules, and budgets.</td>
<td></td>
</tr>
<tr>
<td>Task Manager</td>
<td>Same as above, but stronger role in establishing and maintaining project requirements.</td>
<td>Technical expertise, Assessing trade-offs, Managing task</td>
</tr>
<tr>
<td>Project Engineer</td>
<td>Conducting trade-offs. Directing the technical implementation according to</td>
<td></td>
</tr>
<tr>
<td>Assistant Project Manager</td>
<td>established schedules and budgets.</td>
<td>Leading task specialists</td>
</tr>
<tr>
<td>Project Manager</td>
<td>Same as above, but stronger role in project planning and controlling.</td>
<td>Overall program leadership, Team building, Resolving</td>
</tr>
<tr>
<td>Program Manager</td>
<td>Coordinating and negotiating requirements between sponsor and performing organizations.</td>
<td>conflict, Managing multidisciplinary tasks, Planning</td>
</tr>
<tr>
<td>Executive Program Manager</td>
<td>Bid proposal development and pricing. Establishing project organization and staffing.</td>
<td>and allocating resources, Interfacing with customers/</td>
</tr>
<tr>
<td></td>
<td>Overall leadership toward implementing project plan. Project profit. New business</td>
<td>sponsors</td>
</tr>
<tr>
<td>Director of Programs</td>
<td>Title reserved for very large programs relative to host organization. Responsibilities</td>
<td>Business leadership, Managing overall program businesses,</td>
</tr>
<tr>
<td>V.P. Program Development</td>
<td>same as above. Focus is on directing overall program toward desired business results.</td>
<td>Building program organizations, Developing personnel,</td>
</tr>
<tr>
<td></td>
<td>development.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Responsible for managing multiprogram businesses via various project organizations, each</td>
<td>Leadership, Strategic planning, Directing and managing</td>
</tr>
<tr>
<td></td>
<td>led by a project manager. Focus is on business planning and development, profit</td>
<td>program businesses, Building organizations, Selecting and</td>
</tr>
<tr>
<td></td>
<td>performance, technology development, establishing policies and procedures, program</td>
<td>developing key personnel, Identifying and developing new</td>
</tr>
<tr>
<td></td>
<td>management guidelines, personnel development, organizational development.</td>
<td>business</td>
</tr>
</tbody>
</table>
Because of the potential overlapping nature of job descriptions in a project management environment, some companies try to define responsibilities for each project management position, as shown in Table 4–3.

4.8 THE ORGANIZATIONAL STAFFING PROCESS

Staffing the project organization can become a long and tedious effort, especially on large and complex engineering projects. Three major questions must be answered:

- What people resources are required?
- Where will the people come from?
- What type of project organizational structure will be best?

To determine the people resources required, the types of individuals (possibly job descriptions) must be decided on, as well as how many individuals from each job category are necessary and when these individuals will be needed.

Consider the following situation: As a project manager, you have an activity that requires three separate tasks, all performed within the same line organization. The line manager promises you the best available resources right now for the first task but cannot make any commitments beyond that. The line manager may have only below-average workers available for the second and third tasks. However, the line manager is willing to make a deal with you. He can give you an employee who can do the work but will only give an average performance. If you accept the average employee, the line manager will guarantee that the employee will be available to you for all three tasks. How important is continuity to you? There is no clearly definable answer to this question. Some people will always want the best resources and are willing to fight for them, whereas others prefer continuity and dislike seeing new people coming and going. The author prefers continuity, provided that the assigned employee has the ability to do the up-front planning needed during the first task. The danger in selecting the best employee is that a higher-priority project may come along, and you will lose the employee; or if the employee is an exceptional worker, he may simply be promoted off your project.

Sometimes, a project manager may have to make concessions to get the right people. For example, during the seventh, eighth, and ninth months of your project you need two individuals with special qualifications. The functional manager says that they will be available two months earlier, and that if you don’t pick them up then, there will be no guarantee of their availability during the seventh month. Obviously, the line manager is pressuring you, and you may have to give in. There is also the situation in which the line manager says that he’ll have to borrow people from another department in order to fulfill his commitments for your project. You may have to live with this situation, but be very careful—these employees will be working at a low level on the learning curve, and overtime will not necessarily resolve the problem. You must expect mistakes here.

Line managers often place new employees on projects so they can be upgraded. Project managers often resent this and immediately go to top management for help. If
a line manager says that he can do the work with lower-level people, then the project manager must believe the line manager. After all, the line manager, not the assigned employees, makes the commitment to do the work, and it is the line manager’s neck that is stuck out.

Mutual trust between project and line managers is crucial, especially during staffing sessions. Once a project manager has developed a good working relationship with employees, the project manager would like to keep those individuals assigned to his activities. There is nothing wrong with a project manager requesting the same administrative and/or technical staff as before. Line managers realize this and usually agree to it.

There must also be mutual trust between the project managers themselves. Project managers must work as a team, recognize each other’s needs, and be willing to make decisions that are in the best interest of the company.

Once the resources are defined, the next question must be whether staffing will be from within the existing organization or from outside sources, such as new hires or consultants. Outside consultants are advisable if, and only if, internal manpower resources are being fully utilized on other programs, or if the company does not possess the required project skills. The answer to this question will indicate which organizational form is best for achievement of the objectives. The form might be a matrix, product, or staff project management structure.

Not all companies permit a variety of project organizational forms to exist within the main company structure. Those that do, however, consider the basic questions of classical management before making a decision. These include:

- How is labor specialized?
- What should the span of management be?
  - How much planning is required?
  - Are authority relationships delegated and understood?
  - Are there established performance standards?
  - What is the rate of change of the job requirements?
- Should we have a horizontal or vertical organization?
  - What are the economics?
  - What are the morale implications?
- Do we need a unity-of-command position?

As in any organization, the subordinates can make the superior look good in the performance of his duties. Unfortunately, the project environment is symbolized by temporary assignments in which the main effort put forth by the project manager is to motivate his (temporary) subordinates toward project dedication and to make them fully understand that:

- Teamwork is vital for success.
- Esprit de corps contributes to success.
- Conflicts can occur between project and functional tiers.
- Communication is essential for success.
- Conflicting orders may be given by the:
  - Project manager
• Functional manager
• Upper-level manager
• Unsuccessful performance may result in transfer or dismissal from the project as well as disciplinary action.

Earlier we stated that a project operates as a separate entity but remains attached to the company through company administration policies and procedures. Although project managers can establish their own policies, procedures, and rules, the criteria for promotion must be based on company standards. Project managers should be careful about making commitments they can’t keep. After unkept promises on previous projects, a project manager will find it very difficult to get top-quality personnel to volunteer for another project. Even if top management orders key individuals to be assigned to his project, they will always be skeptical about any promises that he may make.

Selecting the project manager is only one-third of the staffing problem. The next step, selecting the project office personnel and team members, can be a time-consuming chore. The project office consists of personnel who are usually assigned as full-time members of the project. The evaluation process should include active project team members, functional team members available for promotion or transfer, and outside applicants.

Upon completion of the evaluation process, the project manager meets with upper-level management. This coordination is required to assure that:

• All assignments fall within current policies on rank, salary, and promotion.
• The individuals selected can work well with both the project manager (formal reporting) and upper-level management (informal reporting).
• The individuals selected have good working relationships with the functional personnel.

Good project office personnel usually have experience with several types of projects and are self-disciplined.

The third and final step in the staffing of the project office is a meeting between the project manager, upper-level management, and the project manager on whose project the requested individuals are currently assigned. Project managers are very reluctant to give up qualified personnel to other projects, but unfortunately, this procedure is a way of life in a project environment. Upper-level management attends these meetings to show all negotiating parties that top management is concerned with maintaining the best possible mix of individuals from available resources and to help resolve staffing conflicts. Staffing from within is a negotiation process in which upper-level management establishes the ground rules and priorities.

The selected individuals are then notified of the anticipated change and asked their opinions. If individuals have strong resentment to being transferred or reassigned, alternate personnel may be selected to avoid potential problems.

Figure 4–5 shows the typical staffing pattern as a function of time. There is a manpower buildup in the early phases and a manpower decline in the later stages. This means that the project manager should bring people on board as needed and release them as early as possible.
There are several psychological approaches that the project manager can use during the recruitment and staffing process. Consider the following:

- Line managers often receive no visibility or credit for a job well done. Be willing to introduce line managers to the customer.
- Be sure to show people how they can benefit by working for you or on your project.
- Any promises made during recruitment should be documented. The functional organization will remember them long after your project terminates.
- As strange as it may seem, the project manager should encourage conflicts to take place during recruiting and staffing. These conflicts should be brought to the surface and resolved. It is better for conflicts to be resolved during the initial planning stages than to have major confrontations later.

It is unfortunate that recruiting and retaining good personnel are more difficult in a project organizational structure than in a purely traditional one. Clayton Reeser identifies nine potential problems that can exist in project organizations:

- Personnel connected with project forms of organization suffer more anxieties about possible loss of employment than members of functional organizations.
- Individuals temporarily assigned to matrix organizations are more frustrated by authority ambiguity than permanent members of functional organizations.

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Personnel connected with project forms of organization that are nearing their phase-out are more frustrated by what they perceive to be “make work” assignments than members of functional organizations.

Personnel connected with project forms of organization feel more frustrated because of lack of formal procedures and role definitions than members of functional organizations.

Personnel connected with project forms of organization worry more about being set back in their careers than members of functional organizations.

Personnel connected with project forms of organization feel less loyal to their organization than members of functional organizations.

Personnel connected with project forms of organization have more anxieties in feeling that there is no one concerned about their personal development than members of functional organizations.

Permanent members of project forms of organization are more frustrated by multiple levels of management than members of functional organizations.

Frustrations caused by conflict are perceived more seriously by personnel connected with project forms of organization than members of functional organizations.

Grinnell and Apple have identified four additional major problems associated with staffing:

- People trained in single line-of-command organizations find it hard to serve more than one boss.
- People may give lip service to teamwork, but not really know how to develop and maintain a good working team.
- Project and functional managers sometimes tend to compete rather than cooperate with each other.
- Individuals must learn to do more “managing” of themselves.

Thus far we have discussed staffing the project. Unfortunately, there are also situations in which employees must be terminated from the project because of:

- Nonacceptance of rules, policies, and procedures
- Nonacceptance of established formal authority
- Professionalism being more important to them than company loyalty
- Focusing on technical aspects at the expense of the budget and schedule
- Incompetence

There are three possible solutions for working with incompetent personnel. First, the project manager can provide an on-the-spot appraisal of the employee. This includes

identification of weaknesses, corrective action to be taken, and threat of punishment if the
situation continues. A second solution is reassignment of the employee to less critical ac-
tivities. This solution is usually not preferred by project managers. The third and most fre-
quent solution is the removal of the employee.

Although project managers can get project office people (who report to the project
manager) removed directly, the removal of a line employee is an indirect process and must be
accomplished through the line manager. The removal of the line employee should be
made to look like a transfer; otherwise the project manager will be branded as an individ-
ual who fires people.

Executives must be ready to cope with the staffing problems that can occur in a
project environment. C. Ray Gullett has summarized these major problems:

- Staffing levels are more variable in a project environment.
- Performance evaluation is more complex and more subject to error in a matrix
form of organization.
- Wage and salary grades are more difficult to maintain under a matrix form of
organization. Job descriptions are often of less value.
- Training and development are more complex and at the same time more necessary
under a project form of organization.
- Morale problems are potentially greater in a matrix organization.

4.9 THE PROJECT OFFICE

The project team is a combination of the project office and functional employees as shown
in Figure 4–6. Although the figure identifies the project office personnel as assistant
project managers, some employees may not have any such title. The advantage of such a
title is that it entitles the employee to speak directly to the customer. For example, the
project engineer might also be called the assistant project manager for engineering. The
title is important because when the assistant project manager speaks to the customer, he
represents the company, whereas the functional employee represents himself.

The project office is an organization developed to support the project manager in car-
rying out his duties. Project office personnel must have the same dedication toward the
project as the project manager and must have good working relationships with both the
project and functional managers. The responsibilities of the project office include:

- Acting as the focal point of information for both in-house control and customer
reporting
- Controlling time, cost, and performance to adhere to contractual requirements
- Ensuring that all work required is documented and distributed to all key personnel

Ensuring that all work performed is both authorized and funded by contractual documentation

The major responsibility of the project manager and the project office personnel is the integration of work across the functional lines of the organization. Functional units, such as engineering, R&D, and manufacturing, together with extra-company subcontractors, must work toward the same specifications, designs, and even objectives. The lack of proper integration of these functional units is the most common cause of project failure. The team members must be dedicated to all activities required for project success, not just their own functional responsibilities. The problems resulting from lack of integration can best be solved by full-time membership and participation of project office personnel. Not all team members are part of the project office. Functional representatives, performing at the interface position, also act as integrators but at a closer position to where the work is finally accomplished (i.e., the line organization).

One of the biggest challenges facing project managers is determining the size of the project office. The optimal size is determined by a trade-off between the maximum number of members necessary to assure compliance with requirements and the maximum number for keeping the total administrative costs under control. Membership is determined by factors such as project size, internal support requirements, type of project (i.e., R&D, qualification, production), level of technical competency required, and customer support requirements. Membership size is also influenced by how strategic management views the project to be. There is a tendency to enlarge project offices if the project is considered strategic, especially if follow-on work is possible.

On large projects, and even on some smaller efforts, it is often impossible to achieve project success without permanently assigned personnel. The four major activities of the project office, shown below, indicate the need for using full-time people:

- Integration of activities
- In-house and out-of-house communication
These four activities require continuous monitoring by trained project personnel. The training of good project office members may take weeks or even months, and can extend beyond the time allocated for a project. Because key personnel are always in demand, project managers should ask themselves and upper-level management one pivotal question when attempting to staff the project office:

*Are there any projects downstream that could cause me to lose key members of my team?*

If the answer to this question is yes, then it might benefit the project to have the second- or third-choice person selected for the position or even to staff the position on a part-time basis. Another alternative, of course, would be to assign the key members to activities that are not so important and that can be readily performed by replacement personnel. This, however, is impractical because such personnel will not be employed efficiently.

Program managers would like nothing better than to have all of their key personnel assigned full-time for the duration of the program. Unfortunately, this is undesirable, if not impossible, for many projects because:11:

- Skills required by the project vary considerably as the project matures through each of its life-cycle phases.
- Building up large permanently assigned project offices for each project inevitably causes duplication of certain skills (often those in short supply), carrying of people who are not needed on a full-time basis or for a long period, and personnel difficulties in reassignment.
- The project manager may be diverted from his primary task and become the project engineer, for example, in addition to his duties of supervision, administra-
  tion, and dealing with the personnel problems of a large office rather than con-
  centrating on managing all aspects of the project itself.
- Professionally trained people often prefer to work within a group devoted to their professional area, with permanent management having qualifications in the same field, rather than becoming isolated from their specialty peers by being assigned to a project staff.
- Projects are subject to sudden shifts in priority or even to cancellation, and full-time members of a project office are thus exposed to potentially serious threats to their job security; this often causes a reluctance on the part of some people to accept a project assignment.

All of these factors favor keeping the full-time project office as small as possible and dependent on established functional departments and specialized staffs. The approach places great emphasis on the planning and control procedures used on the project. On the

other hand, there are valid reasons for assigning particular people of various specialties to the project office. These specialties usually include:

- Systems analysis and engineering (or equivalent technical discipline) and product quality and configuration control, if the product requires such an effort
- Project planning, scheduling, control, and administrative support

Many times a project office is staffed by promotion of functional specialists. This situation is quite common to engineering firms with a high percentage of technical employees, but is not without problems.

In professional firms, personnel are generally promoted to management on the basis of their professional or technical competence rather than their managerial ability. While this practice may be unavoidable, it does tend to promote men with insufficient knowledge of management techniques and creates a frustrating environment for the professional down the line.  

With regard to the training needed by technicians who aspire to high positions in a world of increasing professionalism in management, more than half of the technically trained executives studied . . . wished that they had had “more training in the business skills traditionally associated with the management function.” In fact, 75 percent admitted that there were gaps in their nontechnical education. . . . Essentially, the engineer whose stock in trade has always been “hard skills” will need to recognize the value of such “soft skills” as psychology, sociology, and so forth, and to make serious and sustained efforts to apply them to his current job.  

There is an unfortunate tendency for executives to create an environment where line employees feel that the “grass is greener” in project management and project engineering than in the line organization. How should an executive handle a situation where line specialists continually apply for transfer to project management? One solution is the development of a dual ladder system, as shown in Figure 4–7, with a pay scale called “consultant.” This particular company created the consultant position because:

- There were several technical specialists who were worth more money to the company but who refused to accept a management position to get it.
- Technical specialists could not be paid more money than line managers.

Promoting technical specialists to a management slot simply to give them more money can:

- Create a poor line manager
- Turn a specialist into a generalist
- Leave a large technical gap in the line organization

---


Line managers often argue that they cannot perform their managerial duties and control these “prima donnas” who earn more money and have a higher pay grade than the line managers. That is faulty reasoning. Every time the consultants do something well, it reflects on the entire line organization, not merely on themselves.

The concept of having functional employees with a higher pay grade than the line manager can also be applied to the horizontal project. It is possible for a junior project manager suddenly to find that the line managers have a higher pay grade than the project manager. It is also possible for assistant project managers (as project engineers) to have a higher pay grade than the project manager. Project management is designed to put together the best mix of people to achieve the objective. If this best mix requires that a grade 7 report to a grade 9 (on a “temporary” project), then so be it. Executives should not let salaries, and pay grades, stand in the way of constructing a good project organization.

Another major concern is the relationship that exists between project office personnel and functional managers. In many organizations, membership in the project office is considered to be more important than in the functional department. Functional members have a ten-
dency to resent an individual who has just been promoted out of a functional department and into project management. Killian has described ways of resolving potential conflicts:\footnote{14}

It must be kept in mind that veteran functional managers cannot be expected to accept direction readily from some lesser executive who is suddenly labelled a Project Manager. Management can avoid this problem by:

- Selecting a man who already has a high position of responsibility or placing him high enough in the organization.
- Assigning him a title as important-sounding as those of functional managers.
- Supporting him in his dealings with functional managers.

If the Project Manager is expected to exercise project control over the functional departments, then he must report to the same level as the departments, or higher.

Executives can severely hinder project managers by limiting their authority to select and organize (when necessary) a project office and team. According to Cleland:\footnote{15}

His [project manager’s] staff should be qualified to provide personal administrative and technical support. He should have sufficient authority to increase or decrease his staff as necessary throughout the life of the project. The authorization should include selective augmentation for varying periods of time from the supporting functional areas.

Many executives have a misconception concerning the makeup and usefulness of the project office. People who work in the project office should be individuals whose first concern is project management, not the enhancement of their technical expertise. It is almost impossible for individuals to perform for any extended period of time in the project office without becoming cross-trained in a second or third project office function. For example, the project manager for cost could acquire enough expertise eventually to act as the assistant to the assistant project manager for procurement. This technique of project office cross-training is an excellent mechanism for creating good project managers.

We have mentioned two important facts concerning the project management staffing process:

- The individual who aspires to become a project manager must be willing to give up technical expertise and become a generalist.
- Individuals can be qualified to be promoted vertically but not horizontally.

Once an employee has demonstrated the necessary attributes to be a good project manager, there are three ways the individual can become a project manager or part of the project office. The executive can:

- Promote the individual in salary and grade and transfer him into project management.

\footnote{15}{David I. Cleland, “Why Project Management?” Reprinted with permission from \textit{Business Horizons}, Winter 1964, p. 85. Copyright © 1964 by the Board of Trustees at Indiana University.}
Laterally transfer the individual into project management without any salary or grade increase. If, after three to six months, the employee demonstrates that he can perform, he will receive an appropriate salary and grade increase.

Give the employee a small salary increase without any grade increase or a grade increase without any salary increase, with the stipulation that additional awards will be forthcoming after the observation period, assuming that the employee can handle the position.

Many executives believe in the philosophy that once an individual enters the world of project management, there are only two places to go: up in the organization or out the door. If an individual is given a promotion and pay increase and is placed in project management and fails, his salary may not be compatible with that of his previous line organization, and now there is no place for him to go. Most executives, and employees, prefer the second method because it actually provides some protection for the employee.

Many companies don’t realize until it is too late that promotions to project management may be based on a different set of criteria from promotions to line management. Promotions on the horizontal line are strongly based on communicative skills, whereas line management promotions are based on technical skills.

4.10 THE FUNCTIONAL TEAM

The project team consists of the project manager, the project office (whose members may or may not report directly to the project manager), and the functional or interface members (who must report horizontally as well as vertically for information flow). Functional team members are often shown on organizational charts as project office team members. This is normally done to satisfy customer requirements.

Upper-level management can have an input into the selection process for functional team members but should not take an active role unless the project and functional managers cannot agree. Functional management must be represented at all staffing meetings because functional staffing is directly dependent on project requirements and because:

- Functional managers generally have more expertise and can identify high-risk areas.
- Functional managers must develop a positive attitude toward project success. This is best achieved by inviting their participation in the early activities of the planning phase.

Functional team members are not always full-time. They can be full-time or part-time for either the duration of the project or only specific phases.

The selection process for both the functional team member and the project office must include evaluation of any special requirements. The most common special requirements develop from:
Changes in technical specifications
Special customer requests
Organizational restructuring because of deviations from existing policies
Compatibility with the customer’s project office

A typical project office may include between ten and thirty members, whereas the total project team may be in excess of a hundred people, causing information to be shared slowly. For large projects, it is desirable to have a full-time functional representative from each major division or department assigned permanently to the project, and perhaps even to the project office. Such representation might include:

- Program management
- Project engineering
- Engineering operations
- Manufacturing operations
- Procurement
- Quality control
- Cost accounting
- Publications
- Marketing
- Sales

Both the project manager and team members must understand fully the responsibilities and functions of each other team member so that total integration can be achieved rapidly and effectively. On high-technology programs the chief project engineer assumes the role of deputy project manager. Project managers must understand the problems that the line managers have when selecting and assigning the project staff. Line managers try to staff with people who understand the need for teamwork.

When employees are attached to a project, the project manager must identify the “star” employees. These are the employees who are vital for the success of the project and who can either make or break the project manager. Most of the time, star employees are found in the line organization, not the project office.

As a final point, project managers can assign line employees added responsibilities within the scope of the project. If the added responsibilities can result in upgrading, then the project manager should consult with the line manager before such situations are initiated. Quite often, line managers (or even personnel representatives) send “check” people into the projects to verify that employees are performing at their proper pay grade. This is very important when working with blue-collar workers who, by union contractual agreements, must be paid at the grade level at which they are performing.

Also, project managers must be willing to surrender resources when they are no longer required. If the project manager constantly cries wolf in a situation where a problem really does not exist, the line manager will simply pull away the resources (this is the line manager’s right), and a deteriorating working relationship will result.
One of the first requirements of the project startup phase is to develop the organizational chart for the project and determine its relationship to the parent organizational structure. Figure 4–8 shows, in abbreviated form, the six major programs at Dalton Corporation. Our concern is with the Midas Program. Although the Midas Program may have the lowest priority of the six programs, it is placed at the top, and in boldface, to give the impression that it is the top priority. This type of representation usually makes the client or customer feel that his program is important to the contractor.

The employees shown in Figure 4–8 may be part-time or full-time, depending upon the project’s requirements. Perturbations on Figure 4–8 might include one employee’s name.
FIGURE 4–9. Midas Program office.

FIGURE 4–10. Typical project team organization. Source: F. A. Hollenbach and D. P. Schultz, "The Organization and Controls of Project Management," Project Management Institute Inc., Realities in Project Management: Proceedings of the 8th Annual Seminars and Symposium, Chicago, Illinois (1977). All rights reserved. Materials from this publication have been reproduced with the permission of PMI. Unauthorized reproduction of this material is strictly prohibited.
identified on two or more vertical positions (i.e., the project engineer on two projects) or the same name in two horizontal boxes (i.e., for a small project, the same person could be the project manager and project engineer). Remember, this type of chart is for the customer’s benefit and may not show the true “dotted/solid” reporting relationships in the company.

The next step is to show the program office structure, as illustrated in Figure 4–9. Note that the chief of operations and the chief engineer have dual reporting responsibility; they report directly to the program manager and indirectly to the directors. Again, this may be just for the customer’s benefit with the real reporting structure being reversed. Beneath the chief engineer, there are three positions. Although these positions appear as solid lines, they might actually be dotted lines. For example, Ed White might be working only part-time on the Midas Program but is still shown on the chart as a permanent program office member. Jean Flood, under contracts, might be spending only ten hours per week on the Midas Program.

FIGURE 4–11. Project engineering department manning for the Midas Program.
If the function of two positions on the organizational chart takes place at different times, then both positions may be shown as manned by the same person. For example, Ed White may have his name under both engineering design and engineering testing if the two activities are far enough apart that he can perform them independently.

The people shown in the project office organizational chart, whether full-time or part-time, may not be physically sitting in the project office. For full-time, long-term assignments, as in construction projects, the employees may be physically sitting side by side (see Figure 4–10), whereas for part-time assignments, it may be imperative for them to sit in their functional group. Remember, these types of charts may simply be eyewash for the customer.

Most customers realize that the top-quality personnel may be shared with other programs and projects. Project manning charts, such as the one shown in Figure 4–11, can be used for this purpose. These manning charts are also helpful in preparing the management volume of proposals to show the customer that key personnel will be readily available on his project.

4.12 SPECIAL PROBLEMS

There are always special problems that influence the organizational staffing process. For example, the department shown in Figure 4–12 has a departmental matrix. All activities stay within the department. Project X and project Y are managed by line employees who have been temporarily assigned to the projects, whereas project Z is headed by supervisor B. The department’s activities involve high-technology engineering as well as R&D.
The biggest problem facing the department managers is that of training their new employees. The training process requires nine to twelve months. The employees become familiar with the functioning of all three sections, and only after training is an employee assigned to one of the sections. Line managers claim that they do not have sufficient time to supervise training. As a result, the department manager in the example found staff person C to be the most competent person to supervise training. A special department training project was set up, as shown in Figure 4–12.

Figure 4–13 shows a utility company that has three full-time project managers controlling three projects, all of which cut across the central division. Unfortunately, the three full-time project managers cannot get sufficient resources from the central division because the line managers are also acting as divisional project managers and saving the best resources for their own projects.

The obvious solution to the problem is that the central division line managers not be permitted to wear two hats. Instead, one full-time project manager can be added to the left division to manage all three central division projects. It is usually best for all project managers to report to the same division for priority setting and conflict resolution.

Line managers have a tendency to feel demoted when they are suddenly told that they can no longer wear two hats. For example, Mr. Adams was a department manager with
thirty years of experience in a company. For the last several years, he had worn two hats and acted as both project manager and functional manager on a variety of projects. He was regarded as an expert in his field. The company decided to incorporate formal project management and established a project management department. Mr. Bell, a thirty-year-old employee with three years of experience with the company, was assigned as the project manager. In order to staff his project, Bell asked Adams for Mr. Cane (Bell’s friend) to be assigned to the project as the functional representative. Cane had been with the company for two years. Adams agreed to the request and informed Cane of his new assignment, closing with the remarks, “This project is yours all the way. I don’t want to have anything to do with it. I’ll be busy with paperwork as a result of the new organizational structure. Just send me a memo once in a while telling me what’s happening.”

During the project kickoff meeting, it became obvious to everyone that the only person with the necessary expertise was Adams. Without his support, the duration of the project could be expected to double.

The real problem here was that Adams wanted to feel important and needed, and was hoping that the project manager would come to him asking for his assistance. The project manager correctly analyzed the situation but refused to ask for the line manager’s help. Instead, the project manager asked an executive to step in and force the line manager to help. The line manager gave his help, but with great reluctance. Today, the line manager provides poor support to the projects that come across his line organization.

4.13 SELECTING THE PROJECT MANAGEMENT IMPLEMENTATION TEAM

The implementation of project management within an organization requires strong executive support and an implementation team that is dedicated to making project management work. Selecting the wrong team players can either lengthen the implementation process or reduce employee morale. Some employees may play destructive roles on a project team. These roles, which undermine project management implementation, are shown in Figure 4–14 and described below:

- The aggressor
  - Criticizes everybody and everything on project management
  - Deflates the status and ego of other team members
  - Always acts aggressively
- The dominator
  - Always tries to take over
  - Professes to know everything about project management
  - Tries to manipulate people
  - Will challenge those in charge for leadership role
- The devil’s advocate
  - Finds fault in all areas of project management
  - Refuses to support project management unless threatened
  - Acts more of a devil than an advocate
The topic jumper
- Must be the first one with a new idea/approach to project management
- Constantly changes topics
- Cannot focus on ideas for a long time unless it is his/her idea
- Tries to keep project management implementation as an action item forever

The recognition seeker
- Always argues in favor of his/her own ideas
- Always demonstrates status consciousness
- Volunteers to become the project manager if status is recognized
- Likes to hear himself/herself talk
- Likes to boast rather than provide meaningful information

The withdrawer
- Is afraid to be criticized
- Will not participate openly unless threatened
- May withhold information
- May be shy

The blocker
- Likes to criticize
- Rejects the views of others
- Cites unrelated examples and personal experiences
- Has multiple reasons why project management will not work

These types of people should not be assigned to project management implementation teams. The types of people who should be assigned to implementation teams are shown in Figure 4–15 and described below. Their roles are indicated by their words:
Selecting the Project Management Implementation Team

The initiators
- “Is there a chance that this might work?”
- “Let’s try this.”

The information seekers
- “Have we tried anything like this before?”
- “Do we know other companies where this has worked?”
- “Can we get this information?”

The information givers
- “Other companies found that . . .”
- “The literature says that . . .”
- “Benchmarking studies indicate that . . .”

The encouragers
- “Your idea has a lot of merit.”
- “The idea is workable, but we may have to make small changes.”
- “What you said will really help us.”

The clarifiers
- “Are we saying that . . . ?”
- “Let me state in my own words what I’m hearing from the team.”
- “Let’s see if we can put this into perspective.”

The harmonizers
- “We sort of agree, don’t we?”
- “Your ideas and mine are close together.”
- “ Aren’t we saying the same thing?”

The consensus takers
- “Let’s see if the team is in agreement.”

FIGURE 4–15. Roles people play that support project management implementation.
“Let’s take a vote on this.”
“Let’s see how the rest of the group feels about this.”
The gate keepers
“Who has not given us their opinions on this yet?”
“Should we keep our options open?”
“Are we prepared to make a decision or recommendation, or is there additional information to be reviewed?”

PROBLEMS


- People trained in single-line-of-command organizations find it hard to serve more than one boss.
- People may give lip service to teamwork, but not really know how to develop and maintain a good working team.
- Project and functional managers sometimes tend to compete rather than cooperate with each other.
- Individuals must learn to do more “managing” of themselves.

The authors identify the above four major problems associated with staffing. Discuss each problem and identify the type of individual most likely to be involved (i.e., engineer, contract administrator, cost accountant, etc.) and in which organizational form this problem would be most apt to occur.

4–2 David Cleland (“Why Project Management?” Reprinted from *Business Horizons*, Winter 1964, p. 85. Copyright © 1964 by the Foundation for the School of Business at Indiana University. Used with permission) made the following remarks:

His [project manager’s] staff should be qualified to provide personal administrative and technical support. He should have sufficient authority to increase or decrease his staff as necessary throughout the life of the project. This authorization should include selective augmentation for varying periods of time from the supporting functional areas.

Do you agree or disagree with these statements? Should the type of project or type of organization play a dominant role in your answer?

4–3 The contractor’s project office is often structured to be compatible with the customer’s project office, sometimes on a one-to-one basis. Some customers view the contractor’s project organization merely as an extension of their own company. Below are three statements concerning this relationship. Are these statements true or false? Defend your answers.

- There must exist mutual trust between the customer and contractor together with a close day-to-day working relationship.
- The project manager and the customer must agree on the hierarchy of decision that each must make, either independently or jointly. (Which decisions can each make independently or jointly?)
- Both the customer and contractor’s project personnel must be willing to make decisions as fast as possible.
C. Ray Gullet (“Personnel Management in the Project Organization,” *Personnel Administration/Public Personnel Review*, November–December 1972, pp. 17–22) has identified five personnel problems. How would you, as a project manager, cope with each problem?

- Staffing levels are more variable in a project environment.
- Performance evaluation is more complex and more subject to error in a matrix form of organization.
- Wage and salary grades are more difficult to maintain under a matrix form of organization. Job descriptions are often of less value.
- Training and development are more complex and at the same time more necessary under a project form of organization.
- Morale problems are potentially greater in a matrix organization.

Some people believe that a project manager functions, in some respects, like a physician. Is there any validity in this?

Paul is a project manager for an effort that requires twelve months. During the seventh, eighth, and ninth months he needs two individuals with special qualifications. The functional manager has promised that these individuals will be available two months before they are needed. If Paul does not assign them to his project at that time, they will be assigned elsewhere and he will have to do with whomever will be available later. What should Paul do? Do you have to make any assumptions in order to defend your answer?

Some of the strongest reasons for promoting functional engineers to project engineers are:

- Better relationships with fellow researchers
- Better prevention of duplication of effort
- Better fostering of teamwork

These reasons are usually applied to R&D situations. Could they also be applied to product life-cycle phases other than R&D?

The following have been given as qualifications for a successful advanced-technology project manager:

- Career has progressed up through the technical ranks
- Knowledgeable in many engineering fields
- Understands general management philosophy and the meaning of profitability
- Interested in training and teaching his superiors
- Understands how to work with perfectionists

Can these same qualifications be modified for non-R&D project management? If so, how?


> It is often the case, therefore, that the Project Manager is more noted for his management technique expertise, his ability to “get things done” and his ability to “get on with people” than for his sheer technical prowess. However, it can be dangerous to minimize this latter talent when choosing Project Managers dependent upon project type and size. The Project Manager should preferably be an expert either in the field of the project task or a subject allied to it.

How dangerous can it be if this latter talent is minimized? Will it be dangerous under all circumstances?
4–10 Frank Boone is the most knowledgeable piping engineer in the company. For five years, the company has turned down his application for transfer to project engineering and project management stating that he is too valuable to the company in his current position. If you were a project manager, would you want this individual as part of your functional team? How should an organization cope with this situation?

4–11 Tom Weeks is manager of the insulation group. During a recent group meeting, Tom commented, “The company is in trouble. As you know, we’re bidding on three programs right now. If we win just one of them, we can probably maintain our current work level. If, by some slim chance, we were to win all three, you’ll all be managers tomorrow.” The company won all three programs, but the insulation group did not hire anyone, and there were no promotions. What would you, as a project manager on one of the new projects, expect your working relations to be with the insulation group?

4–12 You are a project engineer on a high-technology program. As the project begins to wind down, your boss asks you to write a paper so that he can present it at a technical meeting. His name goes first on the paper. Should this be part of your job? How do you feel about this situation?

4–13 Research has indicated that the matrix structure is often confusing because it requires multiple roles for people, with resulting confusion about these roles (Keith Davis, Human Relations at Work, New York: McGraw-Hill, 1967, pp. 296–297). Unfortunately, not all program managers, project managers, and project engineers possess the necessary skills to operate in this environment. Stuckenbruck has stated, “The path to success is strewn with the bodies of project managers who were originally functional line managers and then went into project management” (Linn Stuckenbruck, “The Effective Project Manager,” Project Management Quarterly, Vol. VII, No. 1, March 1976, pp. 26–27). What do you feel is the major cause for this downfall of the functional manager?

4–14 For each of the organizational forms shown below, who determines what resources are needed, when they are needed, and how they will be employed? Who has the authority and responsibility to mobilize these resources?

   a. Traditional organization
   b. Matrix organization
   c. Product line organization
   d. Line/staff project organization

4–15 Do you agree or disagree that project organizational forms encourage peer-to-peer communications and dynamic problem-solving?

4–16 The XYZ Company operates on a traditional structure. The company has just received a contract to develop a new product line for a special group of customers. The company has decided to pull out selected personnel from the functional departments and set up a single product organizational structure to operate in parallel with the functional departments.

   a. Set up the organizational chart.
   b. Do you think this setup can work? Does your answer depend on how many years this situation must exist?

4–17 You are the project engineer on a program similar to one that you directed previously. Should you attempt to obtain the same administrative and/or technical staff that you had before?
4–18 A person assigned to your project is performing unsatisfactorily. What should you do? Will it make a difference if he is in the project office or a functional employee?

4–19 You have been assigned to the project office as an assistant project engineer. You are to report to the chief project engineer who reports formally to the project manager and informally to the vice president of engineering. You have never worked with this chief project engineer before. During the execution of the project, it becomes obvious to you that the chief project engineer is making decisions that do not appear to be in the best interest of the project. What should you do about this?

4–20 Should individuals be promoted to project management because they are at the top of their functional pay grade?

4–21 Should one functional department be permitted to “borrow” (on a temporary basis) people from another functional department in order to fulfill project manning requirements? Should this be permitted if overtime is involved?

4–22 Should a project manager be paid for performance or for the number of people he supervises?

4–23 Should a project manager try to upgrade his personnel?

4–24 Why should a functional manager assign his best people to you on a long-term project?

4–25 A coal company has adopted the philosophy that the project manager for new mine startup projects will be the individual who will eventually become the mine superintendent. The coal company believes that this type of “ownership” philosophy is good. Do you agree?

4–26 Can a project manager be considered as a “hired gun”?

4–27 Manufacturing organizations are using project management/project engineering strictly to give new employees exposure to total company operations. After working on one or two projects, each approximately one to two years in duration, the employee is transferred to line management for his career path and opportunities for advancement. Can a situation such as this, where there is no career path in either project management or project engineering, work successfully? Could there be any detrimental effects on the projects?

4–28 Can a project manager create dedication and a true winning spirit and still be hated by all?

4–29 Can anyone be trained to be a project manager?

4–30 A power and light company has part-time project management in which an individual acts as both a project manager and a functional employee at the same time. The utility company claims that this process prevents an employee from becoming “technically obsolete,” and that when the employee returns to full-time functional duties, he is a more well-rounded individual. Do you agree or disagree? What are the arrangement’s advantages and disadvantages?

4–31 Some industries consider the major criterion for promotion and advancement to be gray hair and/or baldness. Is this type of maturity advantageous?

4–32 In Figure 4–9 we showed that Al Tandy and Don Davis (as well as other project office personnel) reported directly to the project manager and indirectly to functional management. Could this situation be reversed, with the project office personnel reporting indirectly to the project manager and directly to functional management?
Most organizations have “star” people who are usually identified as those individuals who are the key to success. How does a project manager identify these people? Can they be in the project office, or must they be functional employees or managers?

Considering your own industry, what job-related or employee-related factors would you wish to know before selecting someone to be a project manager or a project engineer on an effort valued at:

- $30,000?
- $300,000?
- $3,000,000?
- $30,000,000?

One of the major controversies in project management occurs over whether the project manager needs a command of technology in order to be effective. Consider the following situation:

You are the project manager on a research and development project. Marketing informs you that they have found a customer for your product and that you must make major modifications to satisfy the customer’s requirements. The engineering functional managers tell you that these modifications are impossible. Can a project manager without a command of technology make a viable decision as to whether to risk additional funds and support marketing, or should he believe the functional managers, and tell marketing that the modifications are impossible? How can a project manager, either with or without a command of technology, tell whether the functional managers are giving him an optimistic or a pessimistic opinion?

As a functional employee, you demonstrate that you have exceptionally good writing skills. You are then promoted to the position of special staff assistant to the division manager and told that you are to assume full responsibility for all proposal work that must flow through your division. How do you feel about this? Is it a promotion? Where can you go from here?

Government policymakers content that only high-ranking individuals (high GS grades) can be project managers because a good project manager needs sufficient “clout” to make the project go. In government, the project manager is generally the highest grade on the project team. How can problems of pay grade be overcome? Is the government’s policy effective?

A major utility company is worried about the project manager’s upgrading functional employees. On an eight-month project that employs four hundred full-time project employees, the department managers have set up “check” people whose responsibility is to see that functional employees do not have unauthorized (i.e., not approved by the functional manager) work assignments above their current grade level. Can this system work? What if the work is at a position below their grade level?

A major utility company begins each computer project with a feasibility study in which a cost-benefit analysis is performed. The project managers, all of whom report to a project management division, perform the feasibility study themselves without any functional support. The functional personnel argue that the feasibility study is inaccurate because the functional “experts” are not involved. The project managers, on the other hand, stipulate that they never have sufficient time or money to involve the functional personnel. Can this situation be resolved?

How would you go about training individuals within your company or industry to be good project managers? What assumptions are you making?

Should project teams be allowed to evolve by themselves?
4–42 At what point or phase in the life cycle of a project should a project manager be appointed?

4–43 Top management generally has two schools of thought concerning project management. One school states that the project manager should be used as a means for coordinating activities that cut across several functional departments. The second school states that the project management position should be used as a means of creating future general managers. Which school of thought is correct?

4–44 Some executives feel that personnel working in a project office should be cross-trained in several assistant project management functions. What do you think about this?

4–45 A company has a policy that employees wishing to be project managers must first spend one to one-and-a-half years in the functional employee side of the house so that they can get to know the employees and company policy. What do you think about this?

4–46 Your project has grown to a point where there now exist openings for three full-time assistant project managers. Unfortunately, there are no experienced assistant project managers available. You are told by upper-level management that you will fill these three positions by promotions from within. Where in the organization should you look? During an interview, what questions should you ask potential candidates? Is it possible that you could find candidates who are qualified to be promoted vertically but not horizontally?

4–47 A functional employee has demonstrated the necessary attributes of a potentially successful project manager. Top management can:

- Promote the individual in salary and grade and transfer him into project management.
- LATERALLY TRANSFER THE EMPLOYEE INTO PROJECT MANAGEMENT WITHOUT ANY SALARY OR GRADE INCREASE. IF, AFTER THREE TO SIX MONTHS, THE EMPLOYEE DEMONSTRATES THAT HE CAN PERFORM, HE WILL RECEIVE AN APPROPRIATE SALARY AND GRADE INCREASE.
- Give the employee either a grade increase without any salary increase, or a small salary increase without any grade increase, under the stipulation that additional awards will be given at the end of the observation period, assuming that the employee can handle the position.

If you were in top management, which method would you prefer? If you dislike the above three choices, develop your own alternative. What are the advantages and disadvantages of each choice? For each choice, discuss the ramifications if the employee cannot handle the project management position.