13

Project Termination

As it must to all things, termination comes to every project. At times, project death is quick and clean, but more often it is a long process; and there are times when it is practically impossible to establish that death has occurred. The skill with which termination, or a condition we might call "near termination," is managed has a great deal to do with the quality of life after the project. The termination stage of the project rarely has much impact on technical success or failure, but it has a great deal to do with residual attitudes toward the project—the "taste left in the mouth" of the client, senior management, and the project team. It also has a great deal to do with learning about the things that lead to success—or failure.

At this point, the joy of discovery is past. Problems have been solved, bypassed, lived with, or ignored. Implementation plans have been carried out. The client is delighted, angry, or reasonably satisfied. In construction-type projects where the project cadre remains intact, the termination issue is eased because the team moves on to another challenge. For nonrecurring projects, the issue is far more akin to the breakup of a family. While the members of the family may be on the best of terms, they must now separate, go their individual ways, divide or dispose of the family property, and make plans for individual survival. Unless the project life was only a few weeks or a few months, the change is stressful. For projects organized as weak matrices, there will be only a few individuals, perhaps only the project manager, who "belong" to the project. This may represent an even more stressful situation than the breakup of a large project family because there is little or no peer group for support.

The process of termination is never easy, always complicated, and, as much as we might wish to avoid it, almost always inevitable. The problem is how to accomplish one of the several levels of what is meant by project termination with a minimum of trouble and administrative dislocation.

In this chapter, we examine the variety of conditions that may be generally referred to as *project termination*. We then view some decision-aiding models that can assist an organization in making the termination decision. This requires us to return to the subject of evaluation and discuss indicators of success and failure in projects. We also discuss some procedures that decrease the pain of termination, and others that reduce the administrative problems that

often arise after projects have been terminated. We look into the typical causes of termination, and finally note that the preparation of a project history is an integral part of the termination process.

13.1   THE VARIETIES OF PROJECT TERMINATION

For our purposes, a project can be said to be terminated when work on the substance of the project has ceased or slowed to the point that further progress on the project is no longer possible, when the project has been indefinitely delayed, when its resources have been deployed to other projects, or when project personnel (especially the PM) become personae non gratae with senior management and in the company lunchroom. There may seem to be a spark of life left, but resuscitation to a healthy state is most unlikely. On rare occasions, projects are reborn to a new, glorious existence (Baker, 1997). But such rebirth is not expected, and project team members who "hang on to the bitter end" have allowed optimism to overcome wisdom. The PM must understand that the ancient naval tradition that the captain should go down with the ship does not serve the best interests of the Navy, the crew, the ship, and most certainly not the captain.

On the other hand, the captain must not, ratlike, flee the "ship" at the first sign of trouble. In the next section of this chapter, we note many of the signs and signals that indicate that the project may be in real trouble. At this point, it is appropriate to consider the ways in which a project can be terminated. There are four fundamentally different ways to close out a project: extinction, addition, integration, and starvation.

Termination by Extinction

The project is stopped. It may end because it has been successful and achieved its goals: The new product has been developed and handed over to the client, or the software has been installed and is running.

The project may also be stopped because it is unsuccessful or has been superseded: The new drug failed its efficacy tests; there are better/faster/cheaper/prettier alternatives available; or it will cost too much and take too long to get the desired performance. Changes in the external environment can kill projects, too. The explosion of the Challenger stopped a number of space shuttle projects overnight. More recently, extraordinary cost escalation in the technology and materials associated with automotive racing caused the ruling bodies of both Formula 1 and Indy-car racing to stop (and even repeal) technological change in their respective venues.

A special case of termination by extinction is "termination by murder."* There are all sorts of murders. They range from political assassination to accidental projecticide. When senior executives vie for promotion, projects for which the loser is champion are apt to suffer. Corporate mergers often make certain projects redundant or irrelevant. NCR was forced to cancel several projects following its merger into AT&T, and probably several more when NCR was more recently unmerged.

Two important characteristics of termination by murder, premeditated or not, are the suddenness of project demise and the lack of obvious signals that death is imminent.

When a decision is made to terminate a project by extinction, the most noticeable event is that all activity on the *substance* of the project ceases. A great deal of organizational activity,

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*The authors thank Professor Samuel G. Taylor (University of Wyoming) for noting this special case of termination by extinction.

however, remains to be done. Arrangements must be made for the orderly release of project team members and their reassignment to other activities if they are to remain in the parent organization. The property, equipment, and materials belonging to the project must be disbursed according to the dictates of the project contract or in accord with the established procedures of the parent organization. Finally, the Project Final Report, also known as the *project history*, must be prepared. These subjects will be covered in greater detail later in this chapter.

Termination by Addition

Most projects are "in-house," that is, carried out by the project team for use in the parent organization. If a project is a major success, it may be terminated by institutionalizing it as a formal part of the parent organization. NCR Corporation (prior to its merger and demerger with AT&T), for example, used this method of transforming a project into a division of the firm and then, if real economic stability seems assured, into an independent subsidiary. Essentially the same process occurs when a university creates an academic department out of what originally was a few courses in an existing department. For example, most software engineering and/or information systems departments began by reorganizing an engineering or business school "subspecialty" into a full-fledged department.

When the project is made a more or less full-fledged member of the parent, it lives its first years in a protected status—carrying less than an "adult" share of overhead cost. As the years pass, however, the child is expected gradually to assume the economic responsibilities of full adulthood.

When project success results in termination by addition, the transition is strikingly different from termination by extinction. In both cases the project ceases to exist, but there the similarity stops. Project personnel, property, and equipment are often simply transferred from the dying project to the newly born division. The metamorphosis from project to department, to division, and even to subsidiary is accompanied by budgets and administrative practices that conform to standard procedure in the parent firm, by demands for contribution profits, by the probable decline of political protection from the project's corporate "champion," indeed by a greater exposure to all the usual stresses and strains of regular, routine, day-to-day operations.

It is not uncommon, however, for some of the more adventurous members of the project team to request transfers to other projects or to seek the chance to start new projects. Project life is exciting, and some team members are uncomfortable with what they perceive to be the staid, regulated existence of the parent organization. The change from project to division brings with it a sharply diminished sense of freedom.

This transition poses a difficult time for the PM, who must see to it that the shift is made smoothly. In Part I of this book, and especially in Chapter 3, we referred repeatedly to the indispensable requirement of political sensitivity in the PM. The transition from project to division demands a superior level of political sensitivity for successful accomplishment. Projects lead a sheltered life, for all the risks they run. The regular operating divisions of a firm are subjected to the daily infighting that seems, in most firms, to be a normal result of competition between executives.

Termination by Integration

This method of terminating a project is the most common way of dealing with successful projects, and the most complex. The property, equipment, material, personnel, and functions of the project are distributed among the existing elementcs of the parent organization. The output of the project becomes a standard part of the operating systems of the parent, or client.

Project Management in Practice
Nucor's Approach to Termination by Addition

Nucor, one of the early steel "minimills," is a highly entrepreneurial firm with a compound growth rate of 23 percent per year. In 1987, its sales were $851 million with an executive staff of only 19 monitoring the operations of 23 plants and 4600 employees. As part of its strategy, Nucor in 1983 decided to move into the flat rolled steel market, the largest market for steel products. They thus initiated the construction of a major plant in Crawfordsville, Indiana, which would comprise over 20 percent of their total assets.

As another part of its strategy, Nucor does its own construction management, with most of the construction team then transitioning into permanent positions in the newly constructed plant. In this case, four managers started the conceptual team for the new facility and then brought in 19 other people from outside the company to form the rest of the construction team, none of them ever having built a steel mill before. The manager on the conceptual team for the new plant was the lead person on the site determination team and became the general manager of the facility. The field shift superintendents on the construction project will have permanent managerial responsibility for the melt shop, the hot mill, and the cold mill. The engineers will become supervisors in the mill. Even the secretary/clerk will have a position in the new facility.

Nucor also relies heavily on the services and capabilities of its suppliers in the construction process, since they are such a small firm. But it also reflects Nucor's "lean and mean" philosophy. In this case, the only error the construction team made was underestimating the engineering time required from suppliers, the time coming in at about double the estimate. Even so, the engineering costs (and probably most other labor costs, too) apparently only ran about 20 percent of what it historically costs to build this type of steel facility!

Source: R. Kimball, "Nucor's Strategic Project," *Project Management Journal*, September 1988.

In some cases, the problems of integration are relatively minor. The project team that installed a new piece of software, instructed the client in its operation and maintenance, and then departed, probably left only minor problems behind it, problems familiar to experienced managers. If the installation was a server complete with multiple terminals and many different pieces of software, then the complexities of integration are apt to be more severe. In general, the problems of integration are inversely related to the level of experience that the parent organization (or client) has had with: (1) the technology being integrated and (2) the successful integration of other projects, regardless of technology.

Most problems of termination by addition are also present when the project is integrated. In the case of integration, the project may not be viewed as a competitive interloper, but the project personnel being moved into established units of the parent organization will be so viewed. Also, the project, which flourished so well in its protected existence as a project, may not be quite so healthy in the chill atmosphere of the "real world." The individuals who nurtured the project may have returned to their respective organizational divisions, and may have new responsibilities. They tend to lose their fervid interest in the "old" project.

Following is a list of a few of the more important aspects of the transition from project to integrated operation that must be considered when the project functions are distributed.

1. *Personnel* Where will the project team go? Will it remain a team? If the functions that the team performed are still needed, who will do them? If ex-team members are assigned to a new project, under what conditions or circumstances might they be temporarily available for help on the old project?

2. *Manufacturing*   Is training complete? Are input materials and the required facilities available? Does the production system layout have to be replanned? Did the change create new bottlenecks or line-of-balance problems? Are new operating or control procedures needed? Is the new operation integrated into the firm's computer systems?

3. *Accounting/Finance*   Have the project accounts been closed and audited? Do the new department budgets include the additional work needed by the project? Have the new accounts been created and account numbers been distributed? Has all project property and equipment been distributed according to the contract or established agreements?

4. *Engineering*   Are all drawings complete and on file? Are operating manuals and change procedures understood? Have training programs been altered appropriately for new employees? Have maintenance schedules been adjusted for the change? Do we have a proper level of "spares" in stock?

5. *Information Systems/Software*   Has the new system been thoroughly tested? Is the software properly documented and are "comments" complete? Is the new system fully integrated with current systems? Have the potential users been properly trained to use the new system?

6. *Marketing*   Is the sales department aware of the change? Is marketing in agreement about lead times? Is marketing comfortable with the new line? Is the marketing strategy ready for implementation?

7. *Purchasing, Distribution, Legal, etc.*   Are all these and other functional areas aware of the change? Has each made sure that the transition from project to standard operation has been accomplished within standard organizational guidelines and that standard administrative procedures have been installed?

8. *Risk Identification and Management*   Most of the questions and conditions noted in items 1–7 represent risks for successful integration. They should be handled like any other risks the project has faced, subjected to analysis, and dealt with accordingly.

Termination by Starvation

There is a fourth type of project termination, although strictly speaking, it is not a "termination" at all. It is "slow starvation by budget decrement." Almost anyone who has been involved with projects over a sufficient period of time to have covered a business recession has had to cope with budget cuts. Budget cuts, or decrements, are not rare. Because they are common, they are sometimes used to mask a project termination.

There may be a number of reasons why senior management does not wish to terminate an unsuccessful or obsolete project. In some firms, for example, it is politically dangerous to admit that one has championed a failure, and terminating a project that has not accomplished its goals is an admission of failure. In such a case, the project budget might receive a deep cut—or a series of small cuts—large enough to prevent further progress on the project and to force the reassignment of many project team members. In effect, the project is terminated, but the project still exists as a legal entity complete with sufficient staff to maintain some sort of presence such as a secretary who issues a project "no-progress" report each year. In general, it is considered bad manners to inquire into such projects or to ask why they are still "on the books."

13.2   WHEN TO TERMINATE A PROJECT

The decision to terminate a project early, by whatever method, is difficult. As we emphasized in Chapter 4, projects tend to develop a life of their own—a life seemingly independent of whether or not the project is successful. In an early article on the subject of terminating R & D

projects, Buell (1967) suspected that the main reason so little information was available on the subject was that it was hard to spell out specific guidelines and standards for the decision. He expressed strong doubts about the ability to "wrap everything up in a neat set of quantitative mathematical expressions," and then went on to develop an extensive set of questions that, if answered, should lead management to a decision. While these questions were aimed at R & D projects, they have wide, general applicability. Paraphrased and slightly modified to broaden and extend them beyond R&D projects, they are:

- Is the project still consistent with organizational goals?
- Is it practical? Useful?
- Is management sufficiently enthusiastic about the project to support its implementation?
- Is the scope of the project consistent with the organization's financial strength?
- Is the project consistent with the notion of a "balanced" program in all areas of the organization's technical interests? In "age"? In cost?
- Does the project have the support of all the departments (e.g., finance, manufacturing, marketing, IT, legal, etc.) needed to implement it?
- Is organizational project support being spread too thin?
- Is support of this individual project sufficient for success?
- Does this project represent too great an advance over current technology? Too small an advance?
- Is the project team still innovative, or has it gone stale?
- Can the new knowledge be protected by patent, copyright, or trade secret?
- Could the project be farmed out without loss of quality?
- Is the current project team properly qualified to continue the project?
- Does the organization have the required skills to achieve full implementation or exploitation of the project?
- Has the subject area of the project already been "thoroughly plowed"?
- Has the project lost its key person or champion?
- Is the project team enthusiastic about success?
- Can the potential results be purchased or subcontracted more efficiently than developed in-house?
- Does it seem likely that the project will achieve the minimum goals set for it? Is it still profitable? timely?

We could add many other such questions to Buell's list. For instance:

- Has the project been obviated by technical advances or new products/services developed elsewhere?
- Is the output of the product still cost effective? Has its risk level changed significantly?
- Is it time to integrate or add the project as a part of the regular, ongoing operation of the parent organization?
- Would we support the project if it were proposed today at the time and cost required to complete it?
- Are there better alternative uses for the funds, time, and personnel devoted to the project?
- Has a change in the environment altered the need for the project's output?

Such questions clearly overlap, and the list could easily be extended further. Dean (1968) reports that the probabilities of technical and/or commercial failure are the two most important reasons for terminating projects (see Table 13-1), according to the executives he surveyed. Compared to the great level of research and thought concerning the project selection decision before the 1980s (see also Chapter 2), there has been relatively little research published on the termination decision. But even this bit was more than the work devoted to defining project success. As interest in project termination increased in the mid-1980s, interest in understanding project success also rose. Pinto et al. (1987, 1988) surveyed experienced PMs and found ten factors that the managers felt to be critical to successful project implementation (see Table 13-2). Jiang et al.

Table 13-1   Rank Order of Important Factors Considered in Terminating R&D Projects (36 companies)

Factors	No. of Companies Reporting the Factor as Being Important
Technical	
Low probability of achieving technical objectives or commercializing results	34
Technical or manufacturing problems cannot be solved with available R&D skills	11
Higher priority of other projects requiring R&D labor or funds	10
Economic	
Low profitability or return on investment	23
Too costly to develop as individual product	18
Market	
Low market potential	16
Change in competitive factors or market needs	10
Others	
Too long a time required to achieve commercial results	6
Negative effects on other projects or products	3
Patent problems	1

Source: Dean (1968).

Table 13-2   Critical Success Factors in Order of Importance

1. *Project Mission*—Initial clearly defined goals and general directions.
2. *Top-Management Support*—Willingness of top management to provide the necessary resources and authority/power for project success.
3. *Project Schedule/Plan*—A detailed specification of the individual action steps for project implementation.
4. *Client Consultation*—Communication, consultation, and active listening to all impacted parties.
5. *Personnel*—Recruitment, selection, and training of the necessary personnel for the project team.
6. *Technical Tasks*—Availability of the required technology and expertise to accomplish the specific technical action steps.
7. *Client Acceptance*—The act of "selling" the final project to its ultimate intended users.
8. *Monitoring and Feedback*—Timely provision of comprehensive control information at each stage in the implementation process.
9. *Communication*—The provision of an appropriate network and necessary data to all key actors in the project implementation.
10. *Trouble-shooting*—Ability to handle unexpected crises and deviations from plan.

Source: Pinto et al. (1987).

(1996) surveyed information system "business professionals" on the relative importance of the Pinto et al. critical success factors and came to roughly similar conclusions. Baker et al. (1983) looked at similar factors associated with R & D project success and failure.

A particularly important finding of Baker et al. is that the *factors associated with project success are different for different industries*. Baker's work was restricted to R & D projects, but the Pinto et al. studies covered many different types of projects. They found that the success-related factors differed between fundamentally different types of projects—between R&D and construction projects, for example. At the very least, the factors and their relative importance are idiosyncratic to the industry, to the project type, and, we suggest, possibly to the firm.

Out of this work came some models that could be used to predict project success or failure, based on certain project characteristics or practices. Pinto et al. (1990), using Pinto's work cited above, reported on factors that were associated with project failure. The factors differed for the type of project involved (R&D vs. construction), for the project's position in the life cycle, as well as for the precise way in which "failure" was defined. Green et al. (1993) found that a poor fit with the firm's existing technological expertise and/or with its existing marketing area and channels was a good early predictor of project termination. Kloppenborg et al. (1991) described precursors to success and failure for projects intended to implement expert systems, and Beale et al. (1991) modeled project success, differentiating between factors exogenous and endogenous to the project and the project team.

In the face of this diversity of success factors, it is interesting to note that there are relatively few fundamental reasons why some projects fail to produce satisfactory answers to Buell's questions.

1. *A Project Organization Is Not Required*   The use of the project form of organization was inappropriate for this particular task or in this particular environment. The parent organization must understand the conditions that require instituting a project.

2. *Insufficient Support from Senior Management*   Projects invariably develop needs for resources that were not originally allocated. Arguments between functional departments over the command of such resources are very common. Without the direct support of a champion in senior management, the project is almost certain to lose the resource battle.

3. *Naming the Wrong Person as Project Manager*   This book is testimony to the importance of the PM. A common mistake is to appoint as PM an individual with excellent technical skills but weak managerial skills or training.

4. *Poor Planning*   This is a very common cause of project failure. In the rush to get the substance of the project under way, competent planning is neglected. In such cases, crisis management becomes a way of life, difficulties and errors are compounded, and the project slowly gets farther behind schedule and over budget. Indeed, careful planning is associated with success in almost all empirical research on project success—Tom Peter's "Ready, Fire, Aim" to the contrary notwithstanding. Not only is proper planning often cited as a *success factor*, lack of planning is cited as a *cause of failure* (Black, 1996).

These, and a few other reasons, are the base causes of most project failures. The specific causes of failure, for the most part, derive from these fundamental items. For example,

- No use was made of earlier project Final Reports that contained a number of recommendations for operating projects in the future.
- Time/cost estimates were not prepared by those who had responsibility for doing the work.
- Starting late, the PM jumped into the tasks without adequate planning.
- Project personnel were moved without adjusting the schedule, or were reassigned during slow periods and then were unavailable when needed.

- Project auditors/evaluators were reluctant to conduct careful, detailed meaningful evaluations.
- The project was allowed to continue in existence long after it had ceased to make cost-effective progress.
- Evaluations failed to determine why problems were arising during the early phases of the project life cycle due to inadequate, or no, risk assessment and management.

All these causes of failure underline the need for careful evaluation at all stages of the project. But at the same time, it is most important to note that the lion's share of the attention given to the termination issue is focused on the failing project. It is equally or more important to terminate successful projects at the right time and by proper methods. One rarely mentioned problem affecting many organizations is the inability or unwillingness of successful project managers working on successful projects to "let their projects go." This is a particularly difficult problem for in-house projects. The PM (and team) simply will not release the project to the tender care of the client department. An outstanding technical specialist and manager conducting communications projects was released from employment simply because she insisted on maintaining semipermanent control of projects that had essentially been completed, but which were not released to the users because they "needed further testing" or "fine-tuning."

Also, little consideration has been given to *how* the termination decision is made and *who* makes it. We feel that a broadly based committee of reasonably senior executives is probably best. The broad organizational base of the committee is needed to diffuse and withstand the political pressure that accompanies all terminations—successes and failures alike. To the extent possible, the criteria used by the termination committee should be written and explained in some detail. It is, however, important to write the criteria in such a way that the committee is not frozen into a mechanistic approach to a decision. There are times when hunches should be followed (or rejected) and blind faith should be respected (or ignored). It depends on whose hunches and faith are under consideration (Baker, 1997).

A reviewer of this book noted that we had covered a great many "technical" reasons for terminating projects, but had not said that many projects are terminated for "nontechnical" reasons. There are several nontechnical reasons why projects are terminated, but almost always these terminations seem to be associated with conflict, even when the conflict is anticipated at the beginning of the project.

Political terminations   We mentioned this type of project demise when discussing termination by murder. These terminations are typically the result of conflict between senior managers, one of whom may be terminated along with the project.

Cross-cultural terminations   Multinational projects sometimes fail because the different cultural groups do not/cannot communicate well, or because their working styles do not/cannot mesh. See Chapter 3 for other examples. The conflicts arise when poor communication or diverse working styles cause the different cultures to compete for ascendancy or to engage in win/lose negotiations. The same cross-cultural forces operate when different disciplines, e.g., marketing and engineering, develop precisely the same problems.

Senescence terminations   There are projects that pass away simply because senior managers, the project champion, the PM, and even key project workers lose interest in the project. The project has neither failed nor succeeded. It simply exists. Meanwhile, other new exciting ideas are being projectized. The organization's attention (and resources) is being directed elsewhere. The conflict between the old and the new may not be active. The senescent project simply gives way to the new.

Project Management in Practice
### Terminating the Superconducting Super Collider Project

On October 19, 1993, Congress pulled the plug on the Superconducting Super Collider (SSC) project, ending 11 years of work costing over $2 billion dollars and throwing 2000 people out of work. The objective of the planned $11 billion SSC was to accelerate subatomic particles within a 54-mile underground circular chamber to almost the speed of light and smash them together at energies of 40 trillion electronic volts. The benefits to society of these experiments were unclear, some maintaining they could have been enormous, but others, including congressmen, were less sure.

The project also suffered from an identity crisis. It was not clear if this was to be a U.S. "first" in basic science or a "world" science project, funded in its early stages by a $1 billion commitment from other nations. Although the costs of the SSC had ballooned, the main reason it was terminated was that it lost its political support.* Although the SSC scientists and backers had rallied good will among universities, schools, and scientific meetings, the potential benefits of the project never reached the Clinton administration, where it only enjoyed lukewarm support at best. When a $4 trillion budget deficit appeared likely, the SSC project was sacrificed.

Source: B. Baker and R. Menon, "Politics and Project Performance: The Fourth Dimension of Project Management," *PM Network*, November 1995, pp. 16–21.

*The authors of this book believe that support was lost because Texas was the only state that would directly gain from the project.
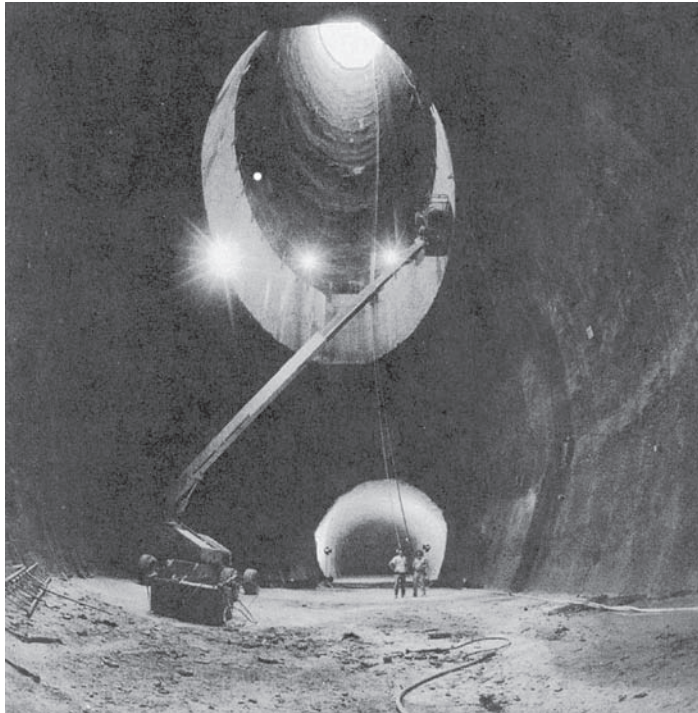
The gigantic tunnels for the super collider are prepared first.

13.3   THE TERMINATION PROCESS

The termination process has two distinct parts. First is the decision whether or not to terminate. Second, if the decision is to terminate the project, the decision must be carried out.

The Decision Process

Decision-aiding models for the termination decision fall into two generic categories. First, there are models that base the decision on the degree to which the project qualifies against a set of factors generally held to be associated with successful (or failed) projects. Second, there are models that base the decision on the degree to which the project meets the goals and objectives set for it.

Balachandra et al. (1980; see also Raelin et al., 1985) state that project selection models are not appropriate for the project termination decision. Kumar et al. (1996, p. 277) agree. The argument is that the data requirements for selection models are too large and costly. They also argue that the evaluation of factors in project selection models may change as projects are evaluated at different stages in their life cycles. They note that the probability of technical success of a project is usually estimated to be close to 1.0 early in the life cycle, but lower during later stages when the technical problems are known. This, they say, would bias decisions in favor of new projects and against ongoing ones.

Lee et al. (1986) think that the first argument is generally untrue of those selection models actually being used, which are typically of modest size. As we have remarked elsewhere in this book, the uncertainty associated with most projects is not concerned with whether or not the project objective is technically achievable, but rather with the time and cost required to achieve it. The fact that selection criteria may change between the time that the project is started and the time it is judged for possible termination is not a relevant criticism of the use of a selection model. Indeed, whatever the source of the criteria for termination, they should be determined by the organization's policy at the time the decision is made—not judged by the policy of some prior time.

Adopting the position that sunk costs are not relevant to current investment decisions, we hold that the primary criterion for project continuance or termination is *whether or not the organization is willing to invest the estimated time and cost required to complete the project, given the project's current status and current expected outcome*. We emphasize that this criterion can be applied to any project.

Shafer et al. (1989) developed a project termination decision support system (DSS) based on a constrained weighted factor scoring model (see Chapter 2). The capabilities of most popular spreadsheets allow direct modeling of the scoring model, allow customized menus, and allow decision makers to adapt and enhance the model as they gain experience in the use of the DSS. The decision criteria, constraints, weights, and environmental data are unique to each organization, as are the specifics of using this (or any) decision model. A detailed discussion of various potential decision rules that might be useful with such a model can be found in Shafer et al. (1989). Figure 13-1 illustrates the structure of this model.

The Implementation Process

Once it has been decided to terminate a project, the process by which it will be terminated must be implemented. The actual termination can be planned and orderly, or a simple hatchet job. The former is apt to have significantly better results, and so we suggest that the termination process be planned, budgeted, and scheduled just as is done for any other phase of the project life cycle. Such a project is illustrated in Figure 13-2. Archibald (1992) has prepared an extensive checklist of items covering the closeout of both the administrative and substantive parts of the project (see Figures 13-3a and b).
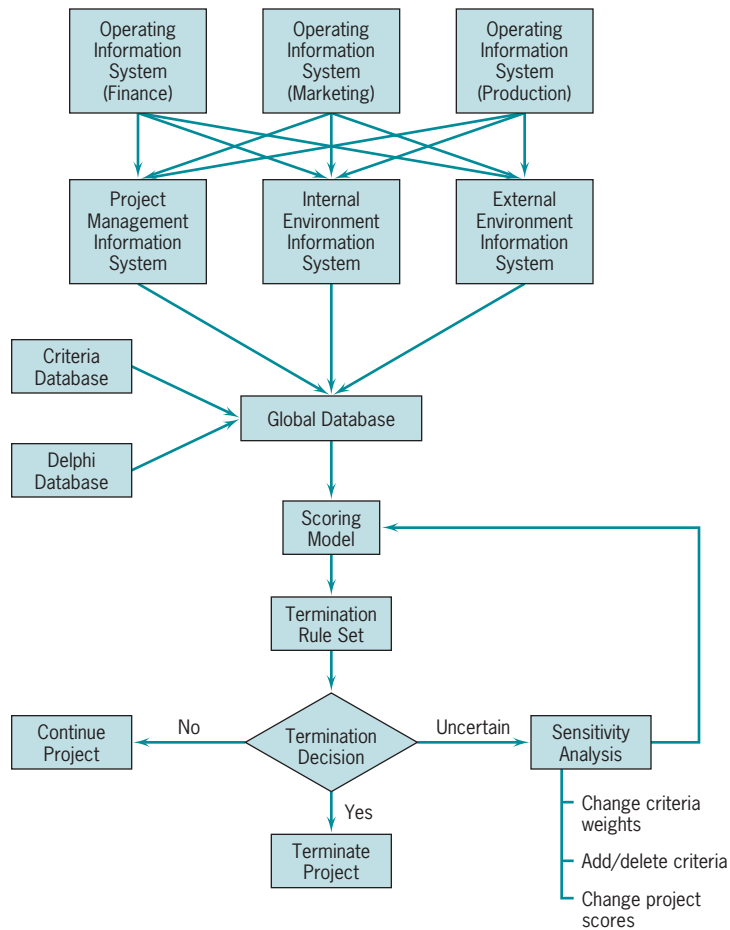
Figure 13-1 DSS structure for a project termination decision. *Source:* Shafer et al. (1989).
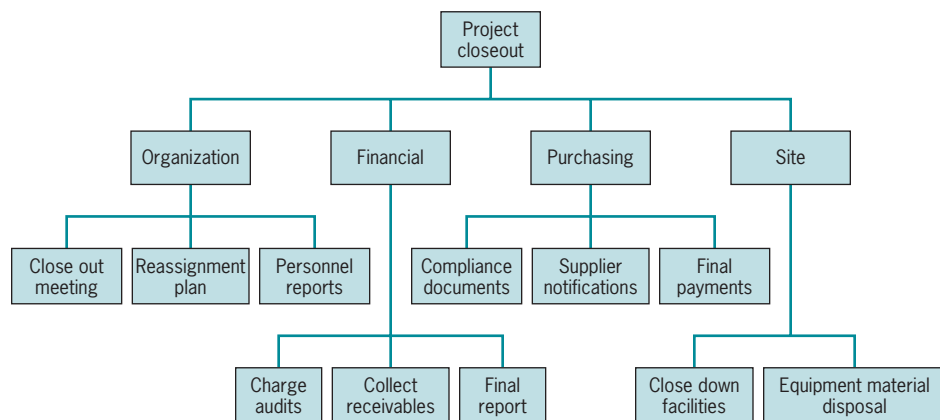

Figure 13-2 Design for project termination.

In some organizations, the processing of the project closeout is conducted under the direct supervision of the PM, but this often raises dilemmas. For many PMs, termination signals the end of their reign as project leader. If the PM has another project to lead, the issue may not be serious; but if there is no other project and if the PM faces a return to a staid life in a functional division, there may be a great temptation to stretch out the termination process.

An examination of Figures 13-2 and 13-3a and 13-3b shows that implementing termination is a complex process. Note that in Figure 13-3b such items as A-4, B-4, C-3, and G-2, among many others, are actually small projects. It is all too easy, at this final stage of the game, to give this mountain of paperwork a "lick and a promise"—easy, but foolish. Someone must handle all the bureaucratic tasks, and if the PM leaves many loose ends, he or she will rapidly get a reputation for being slipshod, a characterization not associated with career success.

The PM also has another option, to ignore the termination process entirely. The evaluation has already been conducted and praise or censure has been delivered. Rather than deal with termination, the PM may let the project administrator handle things. Project team members may well have similar feelings and reactions, and may seek new jobs or affiliations before the project actually ends, thereby dragging out some final tasks interminably.

Special *termination managers* are sometimes useful in completing the long and involved process of shutting down a project. In such cases, the PM is transferred to another project or reassigned to a functional "home." The termination manager does not have to deal with substantive project tasks and therefore may be a person familiar with the administrative requirements of termination and the environment within which the project will be operating (if it continues to live). If personnel performance evaluations are required, and they usually are, they must be prepared by the PM or whoever supervised the work of each individual team member, not by a specially appointed termination manager.

If technical knowledge is required during the termination process, a member of the project team may be upgraded and assigned responsibility for the termination. This "promotion" is often a motivator and will provide development experience for the team member.

PROJECT TITLE _____   COMPLETION DATE _____

CONTRACT NO. _____   COST TYPE _____

CUSTOMER _____   PROJECT MGR. _____

The project close-out check lists are designed for use in the following manner:
Column I—Item No.: Each task listed is identified by a specific number and grouped into categories. Categories are based on functions, not on organizations or equipment.
Column II—Task Description: Task descriptions are brief tasks that could apply to more than one category but are listed only in the most appropriate category.
Column III—Required, Yes or No: Check whether the item listed applies to the project.
Column IV—Date Required: Insert the required date for accomplishment of the task.
Column V—Assigned Responsibility: Insert the name of the person responsible to see that the task is accomplished on schedule. This may be a member of the Project Office or an individual within a functional department.
Column VI—Priority (PR): A priority system established by the Project Manager may be used here; e.g., Priority #1 may be all tasks that must be accomplished before the contractual completion date, Priority #2 within 2 weeks after the completion date, etc.
Column VII—Notes, Reference: Refer in this column to any applicable Procedures, a government specification that may apply to that task, etc.

Figure 13-3a   Instructions for project termination checklist. *Source:* Archibald (1992).

Item No.	Task Description	Required Yes	Required No	Required Date	Assigned Responsibility	PR.	Notes Reference
A.	*Project office (PO) and Project Team (PT) Organization*						
1.	Conduct project close-out meeting						
2.	Establish PO and PT release and reassignment plan						
3.	Carry out necessary personnel actions						
4.	Prepare personal performance evaluation on each PO and PT member						
B.	*Instructions and Procedures issue instructions for:*						
1.	Termination of PO and PT						
2.	Close-out of all work orders and contracts						
3.	Termination of reporting procedures						
4.	Preparation of final report(s)						
5.	Completion and disposition of project file						
C.	*Financial*						
1.	Close out financial documents and records						
2.	Audit final charges and costs						
3.	Prepare final project financial report(s)						
4.	Collect receivables						
D.	*Project Definition*						
1.	Document final approved project scope						
2.	Prepare final project breakdown structure and enter into project file						
E.	*Plans, Budgets, and Schedules*						
1.	Document actual delivery dates of all contractual deliverable end items						
2.	Document actual completion dates of all other contractual obligations						
3.	Prepare final project and task status reports						
F.	*Work Authorization and Control*						
1.	Close out all work orders and contracts						
G.	*Project Evaluation and Control*						
1.	Assure completion of all action assignments						
2.	Prepare final evaluation report(s)						
3.	Conduct final review meeting						
4.	Terminate financial, manpower, and progress reporting procedures						
H.	*Management and Customer Reporting*						
1.	Submit final report to customer						
2.	Submit final report to management						
I.	*Marketing and Contract Administration*						
1.	Compile all final contract documents with revision, waivers, and related correspondence						
2.	Verify and document compliance with all contractual terms						
3.	Compile required proof of shipment and customer acceptance documents						
4.	Officially notify customer of contract completion						
5.	Initiate and pursue any claims against customer						
6.	Prepare and conduct defense against claims by customer						
7.	Initiate public relations announcements re. contract completion						
8.	Prepare final contract status report						
J.	*Extension-New Business*						
1.	Document possibilities for project or contract extensions, or other related new business						
2.	Obtain commitment for extension						
K.	*Project Records Control*						
1.	Complete project file and transmit to designated manager						
2.	Dispose of other project records as required by established procedures						
L.	*Purchasing and Subcontracting*						
	For each Purchase Order and Subcontract:						
1.	Document compliance and completion						
2.	Verify final payment and proper accounting to project						
3.	Notify vendor/contractor of final completion						
M.	*Engineering Documentation*						
1.	Compile and store all engineering documentation						
2.	Prepare final technical report						
N.	*Site Operations*						
1.	Close down site operations						
2.	Dispose of equipment and material						

Figure 13-3b   Checklist for project termination. *Source:* Archibald (1992).

The primary duties of the termination manager are encompassed in the following nine general tasks:

1. Ensure completion of the work, including tasks performed by subcontractors.

2. Notify the client of project completion and ensure that delivery (and installation) is accomplished. Acceptance of the project must be acknowledged by the client.

3. Ensure that documentation is complete, including a terminal evaluation of the project deliverables and preparation of the project's Final Report.

4. Clear for final billings and oversee preparation of the final invoices sent to the client.

5. Redistribute personnel, materials, equipment, and any other resources to the appropriate places.

6. Clear project with legal counsel or consultant. File for patents if appropriate. Record and archive all "nondisclosure" documents.

7. Determine what records (manuals, reports, and other paperwork) to keep. Ensure that such documents are stored in the proper places and that responsibility for document retention is turned over to the parent organization's archivist.

8. Ascertain any product support requirements (e.g., spares, service), decide how such support will be delivered, and assign responsibility.

9. Oversee the closing of the project's books.

It is likely that tasks 1 to 3 will be handled by the regular PM immediately before the project termination process is started. If the termination manager must handle these tasks, technical support will almost certainly be needed. Of course, many of the tasks on this list will be quite simple if the project is not large, but even with small- or medium-sized projects, the PM should make sure all items are covered. For routine projects, e.g., maintenance, simplified checklists are helpful.

Item 5 on this list deserves some amplification. The PM can do a great deal to reduce the problems of termination by dealing with these issues well before the actual termination process begins. As we noted in Chapter 2, arrangements for the distribution and disposal of property and equipment belonging to the project should be included in the proposal and/or in the contract with the client. Obviously, this does not stop all arguments, but it does soften the conflicts. Dealing with project personnel is more difficult.

Most PMs delay the personnel reassignment/release issue as long as possible for three main reasons: a strong reluctance to face the interpersonal conflicts that might arise when new assignments and layoffs are announced; worry that people will lose interest and stop work on the project as soon as it becomes known that termination is being considered; or concern—particularly in the case of a pure project organization—that team members will try to avoid death by stretching out the work as far as possible.

As long as the PM has access to the functional managers' ears, any team member who "quits work" before the project is completed or stalls by stretching out tasks or creating task extensions would be subject to the usual sanctions of the workplace. The PM should make it quite clear that retirement while still on-the-job, and tenure-for-life are equally unacceptable.

The first problem results when project leadership is held by a managerially weak PM. The height of weakness is demonstrated when the PM posts a written list of reassignments and layoffs on the project's bulletin board late Friday afternoon and then leaves for a long weekend. A more useful course of action is to speak with project members individually or in small groups, let them know about plans for termination, and offer to consult with each in order to aid in the reassignment process or to assist in finding new work. (A preliminary announcement to the entire project team is in order because the interviews may cover several weeks or months.) It is

almost impossible to keep termination plans a secret, and to confront the matter immediately tends to minimize rumors.

In a large project, of course, the PM will not be able to conduct personal interviews except with a few senior assistants. The project's personnel officer, or a representative from the parent firm's personnel department, can serve instead. This may seem like an unnecessary service to the team members, but a reputation of "taking care of one's people" is an invaluable aid to the PM when recruiting for the next project.

Termination by murder makes it very difficult to follow these suggestions about dealing with project personnel. The project's death often occurs with so little warning that the PM learns of the fact at the same time as the project team—or, as sometimes happens, learns about it from a member of the project team.

There is little the PM can do in such a case except to try to minimize the damage. The team should be assembled as rapidly as possible and informed, to the best of the PM's ability, about what has happened. At this point the PM should start the reassignment/release process.

Items 6 and 7 on our list, and several items in Figure 13-3b (cf. particularly sections I, K, L, and M) concern retention of project related documents in the parent organization's archives. There are several reasons why document retention may be critically important. Following the completion of the project, the project's parent organization and the client may differ in their recollection of precisely what was promised as output — recall that agreements about the deliverables, including all change orders, must be in writing and signed off by all affected parties. They may differ in their recollection of precisely how nondisclosure agreements were worded. The problem can be avoided by ensuring the documents retained do not include material previously identified as being "confidential." Most nondisclosure agreements require that confidential material be so labeled. If the inclusion of confidential information in project documents is mandatory for clarity or other pertinent reasons, it is sometimes possible to include it with the prior written permission of the discloser, usually conditioned that the project documents not be disclosed to a competitor, or pursuant to a court order, without immediate notice to the discloser so it can get a suitable court order protecting the confidential information. Finally, the parent organization and client may differ in their understanding of precisely what was approved or not approved at various stages of the project's life. Indeed, maintenance of sign-off records at each of the phase-gates of a project life cycle are critical for the parent organization because it relies on the approval of the current stage before investing the resources required to work on the next stage.* We strongly advise that the organization's attorney be consulted on matters of document retention.

13.4   THE FINAL REPORT—A PROJECT HISTORY

PMBOK Guide

Good project management systems have a memory. The embodiment of this memory is the Project Final Report. The final report is not another evaluation; rather, it is the history of the project. It is a chronicle of the life and times of the project, a compendium of what went right and what went wrong, of who served the project in what capacity, of what was done to create the substance of the project, of how it was managed. We learn from experience only if the experience is preserved and studied (Whitten, 1999). The third edition of PMBOK (Project Management Institute, 2004) emphasizes the importance of keeping and reviewing past experience as prelude to new experience.

The elements that should be covered in the final report are listed below. When considering these elements it is also beneficial to consider where the source materials can be found. For

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*We thank T. D. Mantel, Esq., an attorney familiar with the legalities of document retention, for portions of this paragraph.

the most part, the required information is contained in the project master plan, a document that includes the proposal, all action plans, budgets, schedules, change orders, and updates of the above. In addition to the master plan, all project audits and evaluations also contain required input data. Almost everything else required by the final report is reflective, based on the thoughts of the PM and others involved in the project. There is little problem in knowing where the needed documents should be kept—in the project's files. Making sure that they are, in fact, there and that they are, in fact, up to date is a serious concern.

The precise organization of the final report is not a matter of great concern; the content is. Some are organized chronologically, while others feature sections on the technical and administrative aspects of the project. Some are written in a narrative style and some contain copies of all project reports strung together with short commentaries. What matters is that several subjects should be addressed, one way or another, in the final report.

1. *Project Performance*   A key element of the report is a comparison of what the project achieved (the terminal evaluation) with what the project tried to achieve (the project proposal). This comparison may be quite extensive and should include explanations of all significant deviations of actual from plan. A final earned value discussion can also be helpful. Because the final report is not a formal evaluation, it can reflect the best judgment of the PM on why the triumphs and failures occurred. This comparison should be followed with a set of recommendations for future projects dealing with like or similar technical matters.

2. *Administrative Performance*   The substantive side of the project usually gets a great deal of attention, while the administrative side is often ignored until administrative problems occur. There is also a strong tendency on the part of almost everyone to treat the "pencil pushers" with grudging tolerance, at best. The administration of a project cannot solve technical problems, but it can enable good technology to be implemented (or prevent it). Administrative practices should be reviewed, and those that worked particularly well or poorly should be highlighted. It is important, when possible, to report the reasons why some specific practice was effective or ineffective. If poor administration is to be avoided and good practices adopted, it is necessary to understand why some things work well and others do not in the environment of a particular organization. This becomes the basis for the recommendations that accompany the discussion.

3. *Organizational Structure*   Each of the organizational forms used for projects has its own unique set of advantages and disadvantages. The final report should include comments on the ways the structure aided or impeded the progress of the project. If it appears that a modification to the accepted form of project organization—or a change to a different basic organizational form—might be helpful for project management, such a recommendation should be made. Obviously, recommendations should be accompanied by detailed explanations and rationales.

4. *Project and Administrative Teams*   On occasion, individuals who are competent and likable as individuals do not perform well as members of a team when a high level of interpersonal communication and cooperation is required. A confidential section of the final report may be directed to a senior personnel officer of the parent organization, recommending that such individuals not be assigned to future projects. Similarly, the PM may recommend that individuals or groups who are particularly effective when operating as a team be kept together on future projects or when reassigned to the firm's regular operations.

5. *Techniques of Project Management*   The outcome of the project is so dependent on the skill with which the forecasting, planning, budgeting, scheduling, resource allocation, risk management, and control are handled that attention must be given to checking on the way

these tasks were accomplished. If the forecasts, budgets, and schedules were not reasonably accurate, recommendations for improved methods should be made. The techniques used for planning, control, and risk management should also be subject to scrutiny.

For each element covered in the final report, recommendations for changing current practice should be made and defended. Insofar as is possible, the implications of each potential change should be noted. Commonly ignored, but equally important, are comments and recommendations about those aspects of the project that worked unusually well. Most projects, project teams, and PMs develop informal procedures that speed budget preparation, ease the tasks of scheduling, improve forecasts, and the like. The final report is an appropriate repository for such knowledge. Once reported, they can be tested and, if generally useful, can be added to the parent organization's list of approved project management methods.

The fundamental purpose of the final report is to improve future projects. It is ultimately focused on the project itself and on the process by which the project was conducted. Data on the project and its outcomes are available in the many interim reports, audits, and evaluations conducted during the project's life. But data on the process come largely from the PM's recollections. To ensure that significant issues are included, the PM should keep a diary. The PM's diary is not an official project document, but rather an informal collection of thoughts, reflections, and commentaries on project happenings. Such a diary tends to be a rich source of unconventional wisdom when written by a thoughtful PM. It may also be a great source of learning for a young, aspiring PM. Above all, it keeps ideas from "getting lost" amid the welter of activity on the project.

Occasionally, the project diary serves a purpose not originally intended. A PM working for a Minnesota highway construction company made a habit of keeping a project diary, mostly for his own interest and amusement. The firm was sued as the result of an accident on a road under construction. The plaintiff alleged that the highway shoulder was not complete nor was it marked "Under Construction" at the time of the accident. The PM's diary noted daily progress on the road, and it showed that the relevant piece of the road had been completed several days prior to the accident. The company successfully defended its position. All company PMs keep diaries now. A vice president of the firm mentioned that they are the same type of diary his high-school-aged daughter uses.

13.5   A FINAL NOTE

PMBOK Guide

In previous editions we have attached a short epilogue about what we consider to be some unsolved problems that have a major effect on project management. Problem 1 "On the Need for a Universal Information System" is now doable, at least in individual organizations. The PMI's latest edition of PMBOK (Project Management Institute, 2004) recognizes the value of recording the many successes, failures, foul-ups, insights, and problems that occur in most projects. They refer to these as organizational "assets," a most appropriate name. Smart PMs will search them out and read them.

Problem 2 "On the Need for Conflict Resolution in Matrix Management" is the subject of many articles in the past few years. Dozens of helpful managerial suggestions are presented in this literature. It only remains for them to be applied. We have one caveat—do not forget that creativity often results from conflict among creative people. Damping all conflict will produce bland compromise.

Problem 3 "On the Need for New Methods of Rewarding Excellence" is unsolved, but is not amenable to a solution within the area of project management considered apart from the economy as a whole. When PMs are successful, they tend to get promoted into positions where they no longer manage projects. If solutions to the problem of rewarding people ever