INTRODUCTION

The process of project implementation, involving the successful development and introduction of projects in the organization, presents an ongoing challenge for managers. The project implementation process is complex, usually requiring simultaneous attention to a wide variety of human, budgetary, and technical variables. As a result, the organizational project manager is faced with a difficult job characterized by role overload, frenetic activity, fragmentation, and superficiality. Often the typical project
manager has responsibility for successful project outcomes without sufficient power, budget, or people to handle all of the elements essential for project success. In addition, projects are often initiated in the context of a turbulent, unpredictable, and dynamic environment. Consequently, the project manager would be well served by more information about those specific factors critical to project success. The project manager requires the necessary tools to help him or her focus attention on important areas and set differential priorities across different project elements. If it can be demonstrated that a set of factors under the project manager’s control can have a significant impact on project implementation success, the project manager will be better able to effectively deal with the many demands created by his job, channeling his energy more efficiently in attempting to successfully implement the project under development.

This chapter reports on a program of research that has developed the following tools and/or concepts for the practicing project manager.

- A set of ten empirically derived critical project implementation success factors.
- A diagnostic instrument—the Project Implementation Profile (PIP) for measuring the ten factors.
- A ten-factor model of the project implementation process.
- Measures of the key elements of project Strategy and Tactics.
- The effect of Strategy and Tactics on project implementation success.
- The impact of the project life cycle on the relative importance of the critical success factors.

In addition, we propose that as the project moves forward through its life cycle, the project manager must be able to effectively transition from strategic to tactical issues in order to better influence project success. Implications are suggested for practicing managers along with specific approaches to managing the strategy-tactics interface.

**DEFINITIONS**

Before attempting a discussion of the project implementation process, it is first important that some of the key concepts in this chapter be adequately defined, in an effort to remove some of the ambiguity from concepts which are often subject to a wide range of individual interpretations.

**What Is a Project?**

While almost everyone has had experience with projects in one form or another, developing a definition of what exactly a project is is often diffi-
cult. Any definition of a project must be general enough to include examples of the wide variety of organizational activities which managers consider to be "project functions." However, the definition should be narrow enough to include only those specific activities which researchers and practitioners can meaningfully describe as "project-oriented." Two of the many definitions of projects that have been offered may be considered as follows:

A project is an organization of people dedicated to a specific purpose or objective. Projects generally involve large, expensive, unique, or high risk undertakings which have to be completed by a certain date, for a certain amount of money, within some expected level of performance. At a minimum, all projects need to have well defined objectives and sufficient resources to carry out all the required tasks. (24, p. 498)

The second definition is offered by Cleland and Kerzner (7), in their work *A Project Management Dictionary of Terms*, and includes the following characteristics:

[A project is] A combination of human and nonhuman resources pulled together in a temporary organization to achieve a specified purpose. (7, p. 199)

A project, then, can be defined as possessing the following characteristics:

- A defined beginning and end (specified time to completion).
- A specific, preordained goal or set of goals.
  A series of complex or interrelated activities.
  A limited budget.

What Is Successful Project Implementation?

In addition to defining the concept of organizational projects, it is important, before attempting any discussion of the steps leading to a successful project, to describe just exactly what a "successful project" is. Project implementation success has been defined many ways to include a large variety of criteria. However, in its simplest terms, project success can be thought of as incorporating four basic facets. A project is generally considered to be successfully implemented if it

- Comes in on-schedule (time criterion).
- Comes in on-budget (monetary criterion).
Achieves basically all the goals originally set for it (effectiveness criterion).

Is accepted and used by the clients for whom the project is intended (client satisfaction criterion).

By its basic definition, a project comprises a defined time frame to completion, a limited budget, and a specified set of performance characteristics. Further, the project is usually targeted for use by some client, either internal or external to the organization and its project team. It seems reasonable, therefore, that any assessment of project implementation success should include these four measures.

The Project Life Cycle

One method that has been used with some regularity in order to help managers conceptualize the work and budgetary requirements of a project is to make use of the idea of the project life cycle. The concept of the life cycle is familiar to most modern managers. Life cycles are used to explain the rise and demise of organizations, phases in the sales life of a product, etc. In a similar fashion, managers often make use of the life-cycle concept as a valuable tool for better understanding the stages in a project and the likely materials requirements for the project through each distinct phase.

Figure 20-1 shows an example of a project life cycle. This representation of the project life cycle is based on the work of Adams and Barndt (1) and King and Cleland (10). As can be seen, the project’s life cycle has been divided into four distinct stages, including:

1. **Conceptualization**—The initial project stage. At this stage a project is determined as being necessary. Preliminary goals and alternatives are specified, as well as the possible means to accomplish those goals.

2. **Planning**—This stage involves the establishment of a more formalized set of plans to accomplish the initially developed goals. Among planning activities are scheduling, budgeting, and the allocation of other specific tasks and resources.

3. **Execution**—The third stage involves the actual "work" of the project. Materials and resources are procured, the project is produced, and performance capabilities are verified.

4. **Termination**—Once the project is completed, there are several final activities that must be performed. These activities usually include the release of resources and transfer of the project to the clients and, if necessary, the reassignment of project team personnel.
As Figure 20-1 also shows, in addition to the development of four project stages, the life cycle specifies the level of organizational effort necessary to adequately perform the tasks associated with each project stage. Organizational effort can be measured using surrogates such as amount of man-hours, expenditures, assets deployed, or other measures of organizational resource utilization. As one would suspect, during the early Conceptualization and Planning stages, effort requirements are minimal, increasing rapidly during late Planning and project Execution, before diminishing again in the project’s Termination. As a result, the concept of project life cycles can be quite useful to a manager, not only in terms of distinguishing among the stages in the project’s life, but also through indicating likely resource requirements to be expected at each stage.

**DEVELOPMENT OF THE TEN-FACTOR MODEL OF PROJECT IMPLEMENTATION**

Project information was obtained from a group of over 50 managers who had some project involvement within the last two years. Participants were asked to consider a successful project with which they had been involved and then to put themselves in the position of a project manager charged with the responsibility of successful project implementation. They were then asked to indicate things that they could do that would substantially help implementation success. This procedure, sometimes called Project Echo, was developed by Alex Bavelas (4). Responses were then sorted
into categories by two experts. Both experts sorted the responses into ten categories and interrater agreement based on percentage of responses similarly sorted across the total number was 0.50, or 119 out of 236. Eliminating duplications and miscellaneous responses, a total of 94 usable responses were classified across 10 factors. These 10 factors formed the basis for the conceptual model and the diagnostic instrument for measuring relative strength of each factor.

The first factor that was developed was related to the underlying purpose for the implementation and was classified Project Mission. Several authors have discussed the importance of clearly defining goals at the outset of the project. Morris (15) classified the initial stage of project management as consisting of a feasibility decision. Are the goals clear and can they succeed? Bardach’s (3) six-step implementation process begins with instructions to state the plan and its objectives. For both these authors and the purposes of our study, Project Mission has been found to refer to the condition where the goals of the project are clear and understood, not only by the project team involved, but by the other departments in the organization. Underlying themes of responses classified into this factor include statements concerning clarification of goals as well as belief in the likelihood of project success.

The second factor discerned was that of Top Management Support. As noted by Schultz and Slevin (19), management support for projects, or indeed for any implementation, has long been considered of great importance in distinguishing between their ultimate success or failure. Beck (6) sees project management as not only dependent on top management for authority, direction, and support, but as ultimately the conduit for implementing top management’s plans, or goals, for the organization. Further, Manley (14) shows that the degree of management support for a project will lead to significant variations in the clients’ degree of ultimate acceptance or resistance to that project or product. For the purposes of our classification, the factor Top Management Support refers to both the nature and amount of support the project manager can expect from management both for himself as leader and for the project. Management’s support of the project may involve aspects such as allocation of sufficient resources (financial, manpower, time, etc.) as well as the project manager’s confidence in their support in the event of crises.

The third factor to be classified was that of Project Schedule/Plans. Project schedule refers to the importance of developing a detailed plan of the required stages of the implementation process. Ginzberg (8) has drawn parallels between the stages of the implementation process and the Lewin (12) model of Unfreezing-Moving-Freezing, viewing planning and scheduling as the first step in the “Moving” stage. Kolb and Frohman’s (11) model of the consulting process views planning as a two-directional
stage, not only as necessary to the forward-going change process, but as an additional link to subsequent evaluation and possible reentry into the system. Nutt (16) further emphasizes the importance of process planning, breaking down planning into four stages: formulation, conceptualization, detailing, and evaluation. As developed in our model, Project Schedule/Plans refers to the degree to which time schedules, milestones, manpower, and equipment requirements are specified. Further, the schedule should include a satisfactory measurement system as a way of judging actual performance against budget and time allowances.

The fourth factor that was determined is labeled Client Consultation. The “client” is referred to here as anyone who will ultimately be making use of the result of the project, as either a customer outside the company or a department within the organization. The need for client consultation has been found to be increasingly important in attempting to successfully implement a project. Indeed, Manley (14) found that the degree to which clients are personally involved in the implementation process will cause great variation in their support for that project. Further, in the context of the consulting process, Kolb and Frohman (11) view client consultation as the first stage in a program to implement change. As this factor was derived for the model, Client Consultation expresses the necessity of taking into account the needs of the future clients, or users, of the project. It is, therefore, important to determine whether clients for the project have been identified. Once the project manager is aware of the major clients, he is better able to accurately determine if their needs are being met.

The fifth factor was concerned with Personnel issues, including recruitment, selection, and training. (See Table 20-1.) An important, but often overlooked, aspect of the implementation process concerns the nature of the personnel involved. In many situations, personnel for the project team are chosen with less-than-full regard for the skills necessary to actively contribute to implementation success. Some current writers on implementations are including the personnel variable in the equation for project team performance and project success. Hammond (9) has developed a contingency model of the implementation process which includes “people” as a situational variable whose knowledge, skills, goals, and personalities must be considered in assessing the environment of the organization. Only after such a diagnosis takes place can the project management team begin to set objectives and design the implementation approach. For the model, Personnel, as a factor, is concerned with developing a project team with the requisite skills to perform their function. Further, it is important to determine whether project management has built sufficient commitment toward project success on the part of team members.

The sixth factor to be discussed was labeled Technical Tasks. It is
Table 20-1. Factor Definitions.a

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 actions 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. *Troubleshooting*—Ability to handle unexpected crises and deviations from plan.


important that the implementation be well managed by people who understand the project. In addition, there must exist adequate technology to support the project. Technical Tasks refers to the necessity of not only having the necessary personnel for the implementation team, but ensuring that they possess the necessary technical skills and have adequate technology to perform their tasks. Steven Alter (2), writing on implementation risk analysis, identifies two of the eight risk factors as being caused by technical incompatibility: the user’s unfamiliarity with the systems or technology, and cost ineffectiveness.

In addition to Client Consultation at an earlier stage in the project implementation process, it remains of ultimate importance to determine whether the clients for whom the project has been initiated will accept it. *Client Acceptance* refers to the final stage in the implementation process, at which time the ultimate efficacy of the project is to be determined. Too often project managers make the mistake of believing that if they handle the other stages of the implementation process well, the client (either internal or external to the organization) will accept the resulting project. In fact, as several writers have shown, client acceptance is a stage in project implementation that must be managed like any other. As an implementation strategy, Lucas (13) discusses the importance of user participation in the early stages of system development as a way of improving the likelihood of later acceptance. Bean and Radnor (5) examine the use of
“intermediaries” to act as a liaison between the designer, or implementation team, and the project’s potential users as a method to aid in client acceptance.

The eighth factor to be considered is that of Monitoring and Feedback. Monitoring and Feedback refer to the project control processes by which at each stage of the project implementation, key personnel receive feedback on how the project is comparing to initial projections. Making allowances for adequate monitoring and feedback mechanisms gives the project manager the ability to anticipate problems, to oversee corrective measures, and to ensure that no deficiencies are overlooked. Schultz and Slevin (19) demonstrate the evolving nature of implementation and model-building paradigms to have reached the state including formal feedback channels between the model builder and the user. From a budgeting perspective, Souder et al. (23) emphasize the importance of constant monitoring and “fine-tuning” of the process of implementation. For the model, Monitoring and Feedback refers not only to project schedule and budget, but to monitoring performance of members of the project team.

The ninth factor was that of Communication. The need for adequate communication channels is extremely important in creating an atmosphere for successful project implementation. Communication is not only essential within the project team itself, but between the team and the rest of the organization as well as with the client. As the factor Communication has been developed for the model, it refers not only to feedback mechanisms, but the necessity of exchanging information with both clients and the rest of the organization concerning project goals, changes in policies and procedures, status reports, etc.

The tenth and final factor to emerge from classification of the model is Trouble Shooting. As the participants in the study often pointed out, problem areas exist in almost every implementation. Regardless of how carefully the project was initially planned, it is impossible to foresee every trouble area or problem that could possibly arise. As a result, it is important that the project manager make adequate initial arrangements for “troubleshooting” mechanisms to be included in the implementation plan. Such mechanisms make it easier not only to react to problems as they arise, but to foresee and possibly forestall potential trouble areas in the implementation process.

THE MODEL

As Figure 20-2 shows, a framework of project implementation has been developed for heuristic purposes, based on the ten factors discovered in our analysis. Some general characteristics of the model should be noted:
1. The factors appear to be both time sequenced and interdependent.

Conceptually, one could argue that the factors are sequenced to occur (or be considered) in a logical order instead of randomly or concurrently. To illustrate, consider that, according to the framework, it is first important to set the goals or define the mission and benefits of the project before seeking top management support. Furthermore, one could argue that unless consultation with the project’s clients has occurred early in the process, chances of subsequent client acceptance and use, denoting successful implementation, will be negatively affected. Nonetheless, it is important to remember that in actual practice, considerable overlap and reversals can occur in the ordering of the various factors and the sequencing as suggested in the framework is not absolute.

2. The factors for a project implementation can be laid out on a critical path.

Related to the temporal aspect, the factors of project implementation can be laid out in a rough critical path, similar to the critical path method-
ology used to develop a new product or to determine the steps in an OR/MS project. In addition to the set of seven factors along the critical path, ranging from Project Mission to Client Acceptance, other factors such as Communication and Monitoring and Feedback are hypothesized to necessarily occur simultaneously and in harmony with the other sequential factors. As several project managers have indicated to us over the course of this research, it is important that Communication always occur or that Troubleshooting be available throughout the implementation process. It should be noted, however, that the arrows in the model represent information flows and sequences, not necessarily causal or correlational relationships.

3. The model allows the manager to actively interact with and systematically monitor his project.

The sequence of a project implementation is an important consideration for any project manager. Not only are there a prescribed set of steps to be taken in the project implementation process, but because of the order of the steps to be taken, the manager is provided with a checklist for determining the status of the project at any given stage. This monitoring capacity enables the manager to determine where the project is in terms of its life cycle and how rapidly it is moving forward. Further, the manager has the ability to determine the chances for successful implementation given attention has been paid to the proper sequencing of steps and consideration of relevant critical success factors in the implementation process.

A 100-item instrument (10 items per factor) was developed and has been used to measure the relative level of each of these critical success factors (21). This instrument was further refined and reduced to a 50-item instrument (5 items per factor) and is a useful diagnostic tool for project implementation. This instrument has been included in its entirety along with percentile norms for over 400 projects as an implementation aid for project managers.

Table 20-2 demonstrates the results of a recent study in which the ten critical factors were assessed in terms of their overall contribution to project success (17). A data base of over 400 projects were sampled in an effort toward empirical verification of the importance of each of the ten initially developed critical success factors. As can be seen, each of the ten factors was found to be significantly related to project success. Further, the cumulative $r$-square value, representing total amount of the variance explained by the ten factors, was .615. In other words, over 61% of the causes of project implementation success can be explained by the ten critical success factors.
Table 20-2. Results of Multiple Regression on the Ten Critical Success Factors.\(^a\)

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>BETA</th>
<th>T-VALUE</th>
<th>SIG. T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission</td>
<td>.72</td>
<td>19.99</td>
<td>(p &lt; .001)</td>
</tr>
<tr>
<td>Top Management Support</td>
<td>.32</td>
<td>10.60</td>
<td>(p &lt; .001)</td>
</tr>
<tr>
<td>Schedule</td>
<td>.32</td>
<td>10.92</td>
<td>(p &lt; .001)</td>
</tr>
<tr>
<td>Client Consultation</td>
<td>.39</td>
<td>11.86</td>
<td>(p &lt; .001)</td>
</tr>
<tr>
<td>Personnel</td>
<td>.31</td>
<td>10.54</td>
<td>(p &lt; .001)</td>
</tr>
<tr>
<td>Technical Tasks</td>
<td>.43</td>
<td>11.25</td>
<td>(p &lt; .001)</td>
</tr>
<tr>
<td>Client Acceptance</td>
<td>.39</td>
<td>11.46</td>
<td>(p &lt; .001)</td>
</tr>
<tr>
<td>Monitoring and Feedback</td>
<td>.29</td>
<td>10.89</td>
<td>(p &lt; .001)</td>
</tr>
<tr>
<td>Communication</td>
<td>.32</td>
<td>10.38</td>
<td>(p &lt; .001)</td>
</tr>
<tr>
<td>Troubleshooting</td>
<td>.35</td>
<td>11.15</td>
<td>(p &lt; .001)</td>
</tr>
</tbody>
</table>

\(^a\) Total regression equation \(F = 47.8, p < .001\). Cumulative adjusted \(r\)-square = .615.

### STRATEGY AND TACTICS

As one moves through the ten-factor model shown in Figure 20-1, it becomes clear that the general characteristics of the factors change. In fact, the factors can be grouped into meaningful patterns, or more general subdimensions. As Table 20-3 shows, the first three factors, (Mission, Top Management Support, and Schedule) are related to the early “planning” phase of the implementation process. The second dimension, composed of the other seven factors (Client Consultation, Personnel, etc.), may be seen as concerned with the actual process, or “action,” of the implementation. These factors seem less planning in nature and more based on the operationalization of the project implementation process.

These “planning” versus “action” elements in the critical implementation success factors show significant parallels to the distinction between

Table 20-3. Strategic and Tactical Critical Success Factors.

<table>
<thead>
<tr>
<th>STRATEGY</th>
<th>TACTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission</td>
<td>Client Consultation</td>
</tr>
<tr>
<td>Top Management Support</td>
<td>Personnel</td>
</tr>
<tr>
<td>Schedule/Plans</td>
<td>Technical Tasks</td>
</tr>
<tr>
<td></td>
<td>Client Acceptance</td>
</tr>
<tr>
<td></td>
<td>Monitoring and Feedback</td>
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<tr>
<td></td>
<td>Communication</td>
</tr>
<tr>
<td></td>
<td>Troubleshooting</td>
</tr>
</tbody>
</table>
strategy and tactics in the strategic management field. Strategy is often viewed as the process of deciding on overall organizational objectives as well as planning on how to achieve those goals. Tactics are seen as the deployment of a wide variety of human, technical, and financial resources to achieve those strategic plans. Strategy, then, is concerned with the up-front planning, while tactics are specifically focused on how best to operationalize, or achieve, those plans.

It is important that managers understand the differences between strategic and tactical issues. Both are vital to project success, but differentially so as the project moves forward to completion. One method for clarifying the distinction raised between strategy and tactics is through the development of a taxonomy that demonstrates the diverse nature of the two functions. This taxonomy is especially useful if applied to the project management context because it has important implications for determining the relationship between strategy and tactics and the previously mentioned planning versus action aspects of the implementation process. Table 20-4 shows a sample of ten issues which have differing implications for project implementation when approached from either a strategic or a tactical viewpoint.

From a conceptual standpoint, the first three critical success factors are primarily "strategic" in nature, while the last seven are more "tactical." Using the model and the measurement instrument (See Appendix), it is possible to monitor the level of strategy (sum of percentile scores on the first three factors) and tactics (sum of percentile scores on the last seven factors) as the project moves forward in time. In addition to showing the Project Implementation Profile, Appendix 1 also exhibits the set of percentile scores for each of the critical success factors, based on a data base of 418 projects. The manager is able to assess scores on each of the ten factors for his specific project and compare those percentile scores with this previously gathered sample of projects.

**STRATEGY-TACTICS INTERACTION**

In addition to the above conceptualization regarding project implementation as a two-stage process, involving initial strategic actions and supporting tactical activities, there are further implications for project performance based on a consideration of strategic and tactical issues. Figure 20-3 shows the breakdown of strategy and tactics by high and low scores depending upon the level to which these issues were addressed in the project implementation. A high "score" on strategy would imply that the strategy is well developed and effective, as is the similar case with tactics. This value could be assessed either in a subjective or intuitive manner or critical success factors.
Table 20-4. Taxonomy of Strategic Versus Tactical Issues.\(^3\)

<table>
<thead>
<tr>
<th></th>
<th>STRATEGY</th>
<th>TACTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Level of Conduct</strong>—Level within the organization at which project implementation activities and issues are performed or addressed.</td>
<td>Top management</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Subjective/Objective Assessment</strong>—The activities concerned with assessing project goals or status.</td>
<td>Greater subjectivity used at strategic level</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Nature of Problem</strong>—The types of problems which arise and must be dealt with during the project implementation process.</td>
<td>Unstructured, one at a time</td>
</tr>
<tr>
<td>4.</td>
<td><strong>Information Needs</strong>—The determination of the types and quantity of information that is required for the project.</td>
<td>Large amount of information needed, much that is external</td>
</tr>
<tr>
<td>5.</td>
<td><strong>Time Horizons</strong>—The scope or time frame of management’s vision in implementing and evaluating the project.</td>
<td>Long-term, but it varies by the problem</td>
</tr>
<tr>
<td>6.</td>
<td><strong>Completeness</strong>—The degree to which the scope of the entire organization is considered.</td>
<td>Covers the entire scope of the organization</td>
</tr>
<tr>
<td>7.</td>
<td><strong>Reference</strong>—Involves the source, or frame of reference, of the activity to be considered.</td>
<td>The source of all planning in the organization is original</td>
</tr>
<tr>
<td>8.</td>
<td><strong>Detail</strong>—Concerned with how broad or specific problems are laid out and how generally they need to be addressed.</td>
<td>Broad and general</td>
</tr>
<tr>
<td>9.</td>
<td><strong>Ease of Evaluation</strong>—The ease of determining the efficiency and effectiveness of various activities involved in the implementation.</td>
<td>Difficult, because of generality</td>
</tr>
<tr>
<td>10.</td>
<td><strong>Point of View</strong>—The assessment of the focus or viewpoint of the various actors involved in the project implementation.</td>
<td>Corporate</td>
</tr>
</tbody>
</table>

Figure 20-3. Strategy/tactics effectiveness matrix.

more systematically, through use of a project implementation assessment instrument. For example, it may be determined by the project manager that one or more factors within the strategic or tactical clusters is deficient, based on a data base of similar, successful projects. Such deficiencies could have serious implications for the resulting viability of the project under construction.

It may further be possible to speculate on some of the likely outcomes for projects being implemented, given the various combinations of strategic and tactical scores. Figure 20-3 demonstrates the four possible combinations of performance of strategic and tactical activities. It is important to note that the values "high" and "low" in Figure 20-3 are meant to imply strategic and tactical quality, that is, effectiveness of operations performed under the two clusters.

Four types of errors may occur in the implementation process. The first two error types were originally proposed in the context of the development of the field of statistics and statistical tests. The last two error types have been suggested as the result of research on implementation and other organizational change paradigms.

In an organizational setting, Type I error occurs when an action should have been taken and was not. To illustrate, consider a situation in which strategic actions have been adequately performed and suggest development and implementation of a project. Type I error will occur when little
action is subsequently taken and the tactical activities are inadequate to the degree that the project is not developed.

_Type II error_, in the context of project implementation, is defined as taking an action when, in fact, none should be taken. In practical terms, Type II error would likely occur in a situation in which project strategy was ineffective, inaccurate, or poorly done. However, in spite of initial planning inadequacies, goals and schedules were operationalized during the tactical stage of the implementation.

_Type III error_ may also be a consequence of low strategy effectiveness and high tactical quality. Type III error has been defined as solving the wrong problem, or “effectively” taking the wrong action. In this scenario, a problem has been identified, or a project is desired, but due to a badly performed strategic sequence, the wrong problem has been isolated and the subsequently implemented project has little value in that it does not address the intended target. Again, the implications for this error type are to develop and implement a project (tactics), often involving large expenditures of human and budgetary resources, for which inadequate or incorrect initial planning and problem recognition was done (strategy).

The final type of error that is likely to be seen in project implementation is _Type IV error_. Type IV error can be defined as taking an action which solves the right problem but the solution is not used by the organization. An example of Type IV error would occur following an effective strategy that has correctly identified the problem and proposed an effective, or “correct” solution; in this case, a project. Type IV error would result if, following the tactical operationalization, the project was not used by the clients for whom it was intended.

In addition to commenting on possible types of error which may be associated with each cell in Figure 20-3, it is important to understand some of the other aspects of likely outcomes for projects falling within each of the four cells.

**Cell 1: High Strategy—High Tactics**

Quadrant 1 shows the setting for those projects which have been rated highly effective in carrying out both strategy and tactics during the implementation process. Not surprisingly, we would expect that the majority of projects corresponding to this situation would be successfully implemented. In addition to high quality strategic activities (Mission, Top Management Support, Project Schedule) these projects have also been effectively operationalized. This operationalization has taken the form of a “high” rating on tactical issues (Client Consultation, Personnel, etc.). As stated, it would be reasonable to expect resulting projects to generally show a high frequency of implementation success.
Cell 3: Low Strategy—Low Tactics

The reciprocal of the first case is in the third quadrant and consists of a situation in which both strategic and tactical functions were inadequately performed. It would be expected that projects falling into this quadrant would have a high likelihood of implementation failure. Not only is initial strategy low, or poorly performed, but subsequent tactics are also ineffective.

Cell 4: High Strategy—Low Tactics

While the results of projects rated as high strategy—high tactics and low strategy—low tactics may be intuitively obvious, perhaps a more intriguing question concerns the likely outcomes of projects found in the “off-diagonal” of Figure 20-3, namely, high strategy—low tactics and low strategy—high tactics. It is interesting to speculate on the result of these “mixed” scenarios in attempting to assess project success. In fact, it has been found that project implementation efforts falling within these two cells often tend to exhibit characteristics of unique, but fairly consistent, patterns.

Cell 4 refers to the situation in which the project strategy was effectively performed but subsequent tactics were rated as ineffective. As can be seen from Figure 20-3, in addition to a high likelihood of Type I and Type IV errors, one would expect projects classified in this quadrant to exhibit a strong tendency toward “errors of inaction” such as low acceptance and low use by organization members or clients for whom the project was intended. Little is done in the way of effective tactical project implementation following initial competent strategic activities. Low acceptance and use are likely outcomes because tactical duties, including Client Consultation and “selling” of the final project, are poorly performed.

Cell 2: Low Strategy—High Tactics

The final cell represents the reverse of the previous case. In this alternative, project strategy is poorly conceived or initial planning is inadequately developed but tactical operationalization is effectively managed. One of the likely outcomes for projects classified into this cell is what are referred to as “errors of action.” Because of poor strategy, a project may be initially developed and rushed into its implementation without clear ideas of its purpose. In fact, the project may not even be needed by the organization. However, tactical follow-up is well managed to the point where the inadequate or unnecessary project is implemented. This sce-
nario represents a classic example of the "errors of action" in many areas of modern management. The mind-set is often one of "Go ahead and do it" rather than spending enough time early in the project's life to fully develop the strategy and assess whether or not the project is needed and how it should be approached.

**STRATEGY AND TACTICS OVER TIME**

Strategy and tactics are both essential for successful project implementation, but differently so at various stages in the project life cycle. Strategic issues are most important at the beginning of the project. Tactical issues become more important towards the end. This is not to say that there should not be a continuous interaction and testing between the strategic and tactical factors. Strategy is not static and often changes in the dynamic corporation, making continuous monitoring essential. Nevertheless, a successful project manager must be able to transition between strategic and tactical considerations as the project moves forward.

As Figure 20-4 shows, a recent study of over 400 projects has demonstrated that strategic issues become less important and tactical issues become more important to project success over the life of a project (17). The importance value shown in Figure 20-3 has been measured by regression beta weights showing the combined relationships between strategy, tactics, and project success over the four project life-cycle stages. During the early stages, conceptualization and planning, strategy is shown to be

![Figure 20-4. Changes in strategy and tactics across the project life cycle (n = 418).](image-url)
of significantly greater importance to project success than are tactics. As the project moves toward the final termination stage, project strategy and tactics achieve almost equal importance. It appears that throughout the project, initial strategies and goals continue to "drive" the project tactics. In other words, strategy continues to influence and shape tactics. At no point does strategy become unimportant to project success, while tactics increase in efforts to operationalize strategic demands.

These changes in the importance of strategy and tactics to project success have important implications for the project manager. The successful manager must be versatile and able to adapt to these changing circumstances. A project manager who is a brilliant strategist but an ineffective tactician has a strong likelihood of committing errors of Type I and Type IV as the project moves downstream. In addition, these errors may occur after substantial resources have already been expended and commitment made for the project. In contrast, the project manager who is excellent at tactical execution but weak in strategic thinking has a probability of committing errors of Type II and Type III as shown in quadrant 2, Figure 20-3. These errors will more likely occur early in the process, but perhaps stay somewhat undiscovered because of the effectiveness of the manager's execution skills.

IMPLICATIONS FOR MANAGERS

Based on the demands facing project managers and the discussion of strategy and tactics which has been developed in this chapter, there are several conclusions which can be drawn relative to project critical success factors, along with practical implications for managers to help control the project implementation process.

1. Use a Multiple-Factor Model

Project management is a complex task in which the manager must attend to many variables. The more specific one can be with regard to the definition and monitoring of those variables, the more likely a successful outcome for the project will occur. Earlier in this chapter, we had listed a set of ten critical success factors which have been empirically shown to be strongly related to project success, as demonstrated by recent research. In addition to simply providing a list of factors for the project manager to consider, our research has also led to the development of a process framework of project implementation. Within this framework, the ten critical success factors are shown to contain a degree of sequentiality, in that the various factors become more critical to project success at different points
in the project life cycle. As a result, it is important for the project manager to make use of a multiple-factor model, first to understand the variety of factors impacting on project success, and then to be aware of their relative importance across stages in the project implementation process.

2. Think Strategically Early in the Project Life Cycle

Another important implication in our discussion of project strategy and tactics is the breakdown of the ten critical factors into two distinct subdimensions, relating to the concepts of strategy and tactics. Further, it was shown that it is important to consider the “strategic” factors early in the project life cycle, during the Conceptualization and Planning stages when they become most important. As a result, it is necessary to accentuate the strategy factors (Mission, Top Management Support, and Schedule/Plans) during these early stages. It is argued that at this time, these factors are the most significant predictors of project success.

A practical suggestion for organizations implementing projects would be to bring the project manager and his team on board early in the project life cycle (preferably during the Conceptualization phase). Many managers make the mistake of not involving members of their project teams in early planning and conceptual meetings, perhaps under the assumption that the team members should only concern themselves with their specific jobs. In fact, it is very important at an early stage that both the project manager and the project team members “buy in” to the goals of the project and the means to achieve those goals. The more project team members are aware of these goals, the greater the likelihood of their taking active part in the monitoring and troubleshooting of the project and, consequently, the higher the quality of those activities for the project implementation.

3. Think More Tactically as the Project Moves Forward in Time

As Figure 20-4 shows, by the later “work” stages of execution and termination, strategy and tactics are of almost equal importance to project implementation success. Consequently, it is important that the project manager shift the emphasis in the project from “What do we want to do?” to “How do we want to do it?” The specific critical success factors associated with project tactics tend to reemphasize the importance of focusing on the “How” instead of the “What.” Factors such as Personnel, Client Consultation, Communication, Monitoring, etc., are more concerned with attempts to better manage the specific action steps in the project implementation process. While we argue that it is important to
bring the project team on board during the initial strategy phase in the project, it is equally important to manage their shift into a tactical, action mode in which their specific project team duties are performed to help the project toward completion.

4. Make Strategy and Tactics Work for You and Your Project Team

One of the points we have attempted to reinforce in this chapter is that either strong strategy or strong tactics by themselves will not ensure project success. When strategy is strong and tactics are weak, there is a great potential for creating strong, well-intended projects that never get off the ground. Cost and schedule overruns, along with general frustration, are often the side effects from projects which encounter such "errors of inaction." On the other hand, a project which starts off with a weak or poorly conceived strategy and receives strong subsequent tactical operationalization has the likelihood of being successfully implemented, but solves the wrong problem (Type III error). New York advertising agencies can tell horror stories of ad campaigns which were poorly conceived but still implemented, sometimes costing millions of dollars, and were subsequently assessed a disaster and scrubbed.

In addition to having project strategy and tactics working together, it is important to remember (again following the diagram in Figure 20-4) that initially conceived strategy should be used to "drive" tactics. Strategy and tactics are not independent of each other, but should be used together in sequence. Hence, strategy, which is developed in the earliest stages of the project, should be made known to all project team members during the entire implementation process. At no point do the strategic factors become unimportant to project success, but instead they must be continually assessed and reassessed over the life of the project. Using the example of a military scenario, tactics must be used in constant support of the overall strategy. Strategy contains the goals that were initially set and are of paramount importance to any operation.

5. Consciously Plan for and Manage Your Project Team's Transition from Strategy to Tactics

The project team leader needs to actively monitor his or her project through its life cycle. Important to the monitoring process is the attempt to accurately assess the position of the project in its life cycle at several different points throughout the implementation process. For the project manager, it is important to remember that the transition between strategy and tactics involves the inclusion of an additional set of critical success
factors. Instead of concentrating on the set of three factors associated with project strategy, the project manager must also include the second set of factors, thus making use of all the ten factors relating to both strategy and tactics.

An important but often overlooked method to help the project leader manage the transition from strategy to tactics is to make efforts to continually communicate the changing status of the project to the other members of the project team. Communication reemphasizes the importance of a joint, team effort in implementing the project. Further, it reinforces the status of the project relative to its life cycle. The project team is kept aware of the specific stage in which the project resides as well as the degree of strategic versus tactical activities necessary to successfully sequence the project from its current stage to the next phase in its life cycle. Finally, communication helps the project manager keep track of the various activities performed by his or her project team, making it easier to verify that strategic vision is not lost in the later phases of tactical operationalization.

CONCLUSIONS

This chapter has attempted to better define the process of project implementation through exposing the manager to a set of empirically derived factors found to be critical to project success. A ten-factor model has been presented showing these key factors and their hypothesized interrelationships. In addition, a diagnostic instrument, the Project Implementation Profile, has been presented in its entirety as a potential tool for project management and control (See Appendix). It is suggested that the PIP be used on a regular basis as a monitor of these ten key behavioral factors. It was shown that these factors may be subdimensionalized to include those activities related to initial project strategy and subsequent tactical follow-up. These dimensions of strategy and tactics are useful for the project manager in that they prescribe a two-stage process to successful project implementation.

The ability to transition successfully between early strategy and later tactics is an important characteristic for project managers to possess. Figure 20-3 showed a 2-by-2 diagram of likely outcomes for projects when strategy and/or tactics were poorly performed. Figure 20-4 demonstrated the relative importance of strategy and tactics over four distinct stages in the project life cycle, showing that strategy is of great importance initially and decreases over the life cycle while tactics steadily increase in importance. Finally, some specific suggestions were presented for project managers, in an effort to help them better manage the transition which projects go through over their life cycle.
As was stated initially, the project management process represents a complex task. The project manager is continually assaulted with a wide variety of demands on his time and resources. Because of the dynamic nature of most projects, it is becoming increasingly difficult for the project manager to keep adequate control over every aspect in the project which requires attention. This chapter has offered some suggestions to project managers who are intent on better understanding their project during its implementation process, but are at a loss as to how to go about attempting to more adequately ensure project success.

REFERENCES

15. Morris, P. W. G. “Managing Project Interfaces—Key Points for Project Success,” in


