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What Every Manager Needs to Know about Project Management

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THIS PAPER OFFERS ten commonsense principles that will help project managers define goals, establish checkpoints, schedules, and resource requirements, motivate and empower team members, facilitate communication, and manage conflict. *Ed.*

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ALL MANAGERS must plan and manage projects. You may be in production, trying to determine a better way to cut costs in the plant. You may be in marketing, charged with laying out a marketing plan for a new product. You may have to audit the books in one office of your company, in hopes of improving efficiency. All of these projects, and numerous others in your organization, involve deadlines, particular results, budgets, and ambiguity. They require coordination among numerous people, and they require innovation to solve problems. Indeed, projects are the lifeblood of innovation, and today's managers must create innovation in order to compete in a changing world. All managers can do a better job of getting innovative projects done on time, within budget, and according to desired quality standards.

Why must we manage projects more effectively? One clear reason is the rapid technological change that we continue to experience. Every year, one of every eight jobs in the United States did not exist the year before; every year one of every nine jobs is eliminated.¹ Furthermore, we are not integrating our most vital resource—people—with these new jobs in a way that taps people's potential. A recent survey revealed that fewer than 25 percent of employees say they are working near full potential. Half of those surveyed do only what is required to keep their jobs. And 75 percent said they could be significantly more effective.²

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Some would say that we need a revolution in the way we plan and manage our work, our projects, and our innovation if America is to survive, let alone improve. In the foreword to a recent book, *The Leadership Challenge*, Tom Peters writes, "The manager-leader revolution is not optional if you are interested in your children's well-being."³ These are strong words. Do we have the answers for this necessary revolution? Yes, some managers do know the answers.

What we and others have learned from experience, as well as from research on effective project managers, is that the reason some managers get the job done is that they plan and manage effectively.⁴ First they plan, then they manage the plan. Then they continue to plan/manage, plan/manage until they get the job done. We would all agree it is important to plan and manage projects effectively; the difference is that effective project managers do it.

All too often, ineffective managers try to complete a project without a well-designed plan. They use a fix-it mentality. But effective project managers realize that good planning leads to *smaller* problems during implementation. The idea is to go slowly early, so that you can go faster later. More important than just knowing they must plan, effective project managers know *how* to plan. They know how to involve a large number of people in the process. They ask a lot of "what if this happens" and "what can go wrong" questions. They work hard to develop a sense of agreement on the plan from the people who have to work on the project. And they keep the goal in front of people. Just as important, they know when to stop

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planning and move into action. Projects involve a merging of technical and people issues, and effective managers know how to follow ten principles for planning and managing projects.⁵

Planning Projects

The first four principles are used by effective project managers to help ensure that they build a good project plan. Following these rules will help you to carefully think through the project on paper or in your mind before actual startup.

- **Set a Clear Project Goal.** To get the job done effectively, you must mentally start at the finish and work backward. The clearer you are about the end result of your project, even though it may change, the more effectively you can plan how to get there. This may sound obvious, but it is amazing how many managers fail to set a clear project goal.

Have you ever worked on a jigsaw puzzle? How do you begin? By looking at the picture on the box, you learn what the pieces will look like once they are assembled properly. In other words, you start at the end and work backward. It is important that you as the project manager and everyone on the project team be clear about your goal. Even if the team members have excellent skills and you have the best equipment available, the team cannot do a good job if the goal is unclear.

The difficulty is that most people think setting a project goal is easy. It is not. It is hard work. You have to realize that setting a project goal involves a dialogue between you (the project manager), the project team, and the end users of the project. Whether the end users are upper managers or customers, engage them in a dialogue to clarify exactly what it is they want; also, involve others on the project team in the dialogue.

Two of your most important tools in this process are a piece of paper and a pencil. If you write down a project goal on a piece of paper, you can give it to upper management or the customer and say, "Is this what you want?" It is amazing how often people can tell you that what you have written down is not what they want, even though they have difficulty telling you exactly what it is they *do* want. Every time you show them your next version, you get closer to having a clearly stated goal.

You are striving to be very, very specific about what you wish to accomplish. You want to be so

specific and so clear that you could drop dead tomorrow and somebody else could pick up the written goal and know exactly what to do. One key to making a goal this specific is making sure it is measurable. If you can measure the goal and your progress toward the goal, then and only then can you begin to manage the project. Any goal that can be stated can be measured; it's just that some goals can be measured more easily than others. By being sure the goal is specific and measurable, you make sure that everybody on the project team, including the end user, buys into the project direction.

- **Determine the Project Objectives.** Once you have gone through the goal-setting process, you can begin to add more detail to the plan. You can establish objectives for the various team members. Generally speaking, you need an objective for each functional group or person associated with the project. Objectives help to break the goal down into specific responsibilities for each team member, and they help the team members understand how their contributions relate to the overall goal.

By identifying each objective with a specific group (or a specific individual) and talking about its formulation, you begin to establish ownership. People take responsibility and become committed to accomplishing the objective. In short, this process helps the team members help you manage the project. You have to realize that you cannot do it all by yourself. You must have a team to get a project done on time.

Just as you want to make sure that the project goal is clear, you also want to make sure that the project objectives are clear to team members. In addition, people need daily reminders of what they are trying to accomplish, and of how their own objective relates to the project goal. It is extremely easy for people to lose sight of the goal as they focus on day-to-day activities that they must complete. For example, manufacturing may build a product that cannot be marketed effectively. Marketing may promise customized products when operations are based on a mass-production system. The key to avoiding too narrow a focus is to keep the project goal out in the open; that is the project manager's job.

You should also remember that you cannot just set the objectives and forget about them. An ancient Chinese proverb captures this point well: "People do not what the boss expects, but what the

boss inspects.” In other words, it is foolish to expect a result when you are not rewarding and paying attention to that result.⁶ If you want people to be motivated on a project, keep the overall project goal and their objectives in their minds, but also reward their efforts that lead toward the objectives and the project goal. Pat them on the back. If possible, give them other tangible rewards.

- **Establish Checkpoints, Activities, Relationships, and Time Estimates.** While project goals and project objectives are extremely important, they alone are not enough to get the job done. You also need checkpoints and activities. You must have an action plan to detail what is going to be done next and how you will monitor your progress toward project completion. Such an action plan consists of checkpoints, activities, relationships among the activities, and time estimates for the activities.

Checkpoints are like the markers that in ancient times were placed every so often along the road to let travelers know they were headed in the right direction. These checkpoints help you monitor your progress toward project completion and, what may be even more important, they help individual team members monitor their own progress.

In establishing these it is important to think about both long- and short-term checkpoints. Suppose, for example, that you want to take a bike-touring trip through Europe, from Paris to Rome. Some of the major checkpoints along the way would be reaching Geneva, in Switzerland, and reaching Genova, on the coast of Italy. Achieving one of these checkpoints would indicate that you are getting closer to your final goal. Failing to achieve them could create serious delays for you. If, for example, after leaving Geneva you find yourself in Zurich instead of Genova, you know that you have made a wrong turn. But this is clearly a big mistake that has taken you hundreds of kilometers in the wrong direction. It would have been good to catch the mistake earlier. Short-term checkpoints serve just this early-detection purpose by establishing more frequent feedback about your progress in achieving the project goal. On your bike trip from Paris to Rome, some short-term checkpoints might be crossing the border into France right after leaving Geneva, or reaching Torino in northern Italy. If you leave Geneva and do not soon see signs for the French border, you realize immediately that you have made a mistake and can correct it. Clearly, it takes a great deal of thinking to come up with

an adequate set of checkpoints for a project. So again, we are talking about a commitment to the planning process before you actually begin the project.

In addition to checkpoints, you need to spell out *activities* that must be performed to carry you from one checkpoint to the next. It is extremely important when defining project activities to work in as much detail as possible. You do not want to overlook any activity necessary to completing the project. Referring again to the bike-touring project, suppose you overlook checking the lubrication on your bike chain one day when you stop for lunch. Your failure to perform this simple activity could result in the chain breaking and could halt your entire project. The more time you spend up front thinking about activities and checkpoints, the better off you are going to be.⁷

Once you have a complete list of activities, you can determine the *relationships* among them. It may be that certain activities have to be performed before others, but it may be possible to perform some of them simultaneously. The only way to determine this is to think about it carefully. Think backward through the project and the list of activities. Think about, “Before I do Activity B, I must do Activity A. Or, at the same time I’m doing Activity C, I can be doing Activity D.” You must determine what the necessary and logical order of activities is. Are there particular technical needs that require activities to occur in a certain order? For example, before I painted my car, I would need to make sure it was sanded and that any dents were corrected. I would not want to do those activities at the same time nor to reverse their order.

However, there may be many different ways in which the activities can be sequenced. Or possibly an activity that one group was going to do can be done by another group. Try to anticipate the unexpected and consider the alternatives. Ask the “what if” and “what can go wrong” questions, but be sure you do not lose sight of the project goal.

The last part of this principle is to determine the *time* and other resources necessary to complete each of the activities. How long will it take to get this activity done? How much will it cost? Who is going to do it? What equipment do you need? What other resources might you need? Usually you have to depend on estimates at this point, because you will not know exactly how long an activity is going to take or how much it is going to cost

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until it is completed. There is no easy way to establish these estimates. You may want to consider such issues as these: "If everything went beautifully, how long would it take?" "If we had lots of problems, how long would it take?" "What is the most likely scenario?" By asking these questions, you not only arrive at a more accurate estimate, but you begin to think about the things that could go wrong, or the things that could go extremely well. By asking a number of people about their estimates, you continue to build commitment to the project.⁸

Be sure to spend plenty of time and energy coming up with a thorough set of activities and checkpoints. Work hard to develop accurate estimates of time and resources. Clarify the relationships that must exist among the activities. This level of detail at this point not only helps develop a good plan, it also sets up the mechanism for monitoring the project as it progresses.

• **Draw a Picture of the Project Schedule.** We have explored the essential, thorough, and rewarding process of building your project plan. In order to use the information developed above, you must now draw a picture—a schedule—of the project.

There are two types of schedules commonly used in project management. One is the bar or Gantt

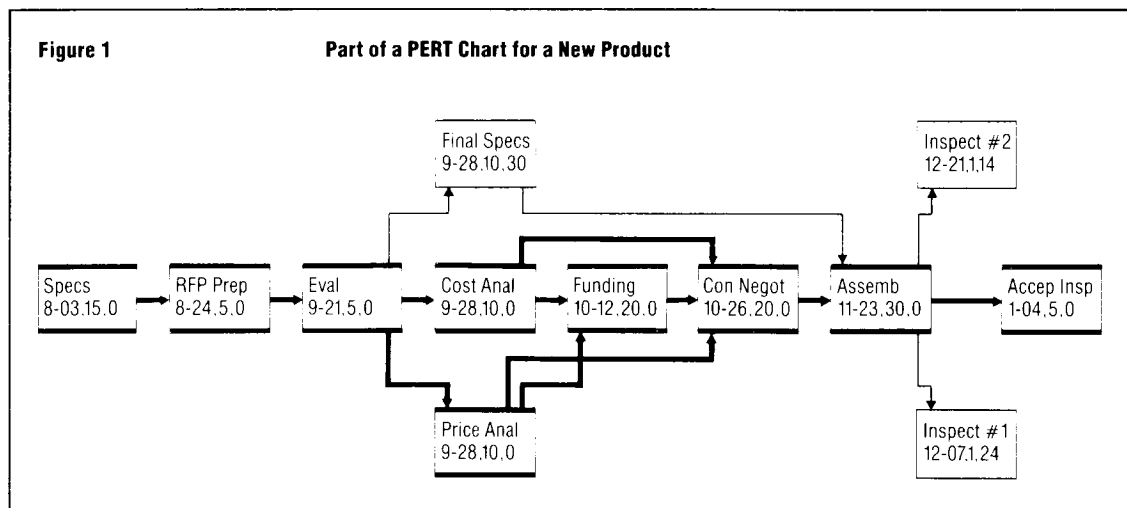
chart. The other is the flow or PERT (program evaluation and review technique) chart. Both are ways to visualize the project activities, the relationships among the activities, and the time estimates developed in the three previous principles.

Table 1 and Figure 1 show these two types of charts. The sample project is a new product. The phase shown involves the procurement of an externally produced component. Both schedules are from a program called Project Manager's Workbench. By looking at the Gantt (or bar) chart, you can see what you have scheduled when and what the length of time is for each activity (see Table 1). The critical (or longest) path of activities is marked by a "C," and the utilization of resources is shown at the bottom of the printout. As time passes, you can update the chart to determine whether you are ahead of schedule, behind schedule, or on schedule.

In the case of the PERT chart, the sequence of activities becomes immediately clear—which is the selling point of a flow chart (see Figure 1). The bold-lined boxes indicate the critical path. Most effective project managers use both types of charts and capitalize on the strengths of each. When projects are complex, managers also employ a user-

Table 1 Part of a Gantt Chart for a New Product

New Product	Da	Who	August 1987					September 1987				October 1987				November 1987				December 1987				January 1988					
			3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	
Procurement of Externally P																													
Selection of Manufacturer																													
Specifications	40	A D P	C																										
RFP Preparation	15	D P C		C																									
Evaluation	20	A D P							C																				
Financial Plan																													
Analysis of Costs	25	V D P								C																			
Analysis of Pricing	27	A DA								C																			
Source of Funding	30	DA C									C																		
Contract Negotiation	35	V DA										C																	
Component Assembly																													
Final Engineering Specs	25	D V U																											
Assembly/Manufacture	30	V											C																
Interim Inspection #1	3	V D P																											
Interim Inspection #2	3	V D P																											
Acceptance Inspection	20	V A P																										C	
Resource Summary																													
Acct Mgr	5.0	A		5.0	5.0	5.0				5.0	5.0	5.0																	
Div Srv Mgr	5.0	D		5.0	5.0	5.0	5.0			5.0	7.5	7.5								1.0	1.0							5.0	
Prod Mgr	5.0	P		1.7	1.7	1.7	5.0			5.0	7.5	7.5				1.3	1.3	1.3	1.3			1.0	1.0					5.0	
Med Tech	5.0	U		1.7	1.7	1.7			5.0	2.5	2.5																		
Controller	5.0	C					5.0			5.0	2.5	2.5																	
Vendor	5.0	V								1.0	1.0	2.5	2.5	5.0	5.0	2.5	2.5												
Division Admin	5.0	DA								10.0	10.0	2.5	2.5	5.0	5.0	2.5	2.5	5.0	5.0	6.0	5.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	
										5.0	5.0	2.5	2.5	5.0	5.0	2.5	2.5												
Total Days				13.3	13.3	13.3	15.0			20.0	38.5	38.5	7.5	7.5	16.3	16.3	8.8	8.8	5.0	5.0	8.0	5.0	8.0	5.0	8.0	5.0	20.0		



friendly software package to aid in drawing and updating their project schedules.⁹

It is important to recognize that the computer cannot do the steps outlined in the first three principles. You and the project team must define the goal and objectives. You and the project team must think through the checkpoints, activities, relationships, and time estimates. In other words, you must develop the project plan. The computer can aid in drawing a picture of your plan.

Managing Projects

Once you have developed a project plan, then you have to manage the plan and the people. Having a good plan does not mean that your project will be successful. We all recognize this fact, but here again effective project managers know *how* to manage a plan through to completion. They recognize that the people issues, as well as the technical issues, now become extremely important. They follow six additional principles of effective project management.

- **Direct People Individually and as a Project Team.** The most fundamental but overlooked principle of managing projects is this: You cannot do it alone. Projects often fail because managers do not develop a strong team of supporters and collaborators. More often than not, this happens because the project manager does not take the time to understand the perspectives of others.

Unfortunately, there is no easy formula for managing people on project teams. We all have theories about why people do what they do. But to be a successful project manager, you must learn to put yourself in the other person's shoes. You

must constantly be open to learning about people, yourself included.

Studies reveal that people learn best about becoming effective project managers by learning from their own experiences.¹⁰ When you complete a project, time and energy should be devoted to these questions: What did we learn? How could we have accomplished this better? What would we do similarly or differently next time? Doing this leads to an accumulation of experiential learning; *not* doing it can lead to ten years of experience equaling one year's experience and mistakes repeated ten times.

Another important lesson is that people do things because they are motivated to do them. It may seem stupid to you, for example, that engineering has not released the design plans even though they are 95 percent completed and two months past due. But it makes sense to the engineers, because they are swamped with work; they believe their request for additional staff will be stronger if it appears they cannot complete projects on time.

Behavior is not random and capricious. When we say people are unmotivated, we are really thinking about people who are unmotivated to do something we want them to do. It is from our perspective—not theirs—that they are unmotivated. As project manager, you have to think about motivation as the overlap between project goals and individual goals. Remember, all people are motivated. The question is, "What are they motivated to do?"

What good project managers realize is that people are alike in that they have similar needs, but that their needs at a particular time may be very different. Individual members of your project team will have to be treated as individuals if you expect

them to be motivated. Do not expect other people to view things exactly as you do, no matter how clear things seem to you or how certain you are about the accuracy of your point of view. Rather, expect differences, since each person filters the same information through a different screen. Research has shown over and over again that project managers who are sensitive to why people do what they do are a step ahead of their colleagues when it comes to directing the efforts of the project team toward the finish line.¹¹

- **Reinforce the Commitment and Excitement of the Project Team.** The best way to get people committed to a project is to allow them to volunteer to become involved. People who sign up for a project no longer need to be coerced to work; it becomes their project. Indeed, a study at Texas Instruments found the best predictor of success was whether participants had volunteered.¹²

In another example, a district manager for a large public utility company developed greater teamwork among the field and office staffs by asking people (not ordering them) if they wanted to “shadow” each other for a day. Field people volunteered to come into the office and office people volunteered to go into the field so they could see firsthand what their counterpart’s job required. Based on this effort, the employees themselves found numerous opportunities to work together on projects of mutual interest.

Such efforts help ensure that the project team is behind the project, pushing it ahead, rather than in front of it acting as a roadblock. Giving people the opportunity to help create goals and objectives is another way to build team members’ commitment. When people feel they can exercise discretion, they feel a greater sense of ownership and a higher commitment to success. And when people “go public” with their choices, their level of commitment tends to increase even more. A good example of this process occurs at one Silicon Valley manufacturing plant each morning. The production supervisors stand up in front of their peers and managers and announce the previous day’s output and reliability levels. Then they make a statement about what they will achieve that day, and they are held accountable for these statements.¹³

In addition to maintaining commitment, you maintain excitement by “encouraging the heart” of the team members. Do not make the mistake of assuming that everybody responds to money. Think of additional rewards that you can give people.

When companies establish a “person of the month” award or an award for a period without rejects, they are trying to recognize and build excitement about work.

One of the best ways to do this is to increase the visibility of the project team’s efforts. Pushing project visibility and allowing people to enjoy their success builds tremendous excitement. Do not be afraid to spread the “attaboys” around. Project team members seldom complain that they are thanked too much by their managers. Team members want to be effective, they want to be noticed, and they want to be appreciated. People do not begin each day with a desire to lose, and it is your job to show people how they can win.

- **Keep Everyone Connected with the Project Informed.** The simple truth is that most project managers do not communicate as effectively as they should. They do not keep project members or themselves properly informed. There are many barriers to communication, some of which are personal; however, what appear to be more important on projects are the organizational barriers. These arise out of the very nature of projects. Projects involve people from different departments who use different languages, have different objectives, and have different types of training, yet who must work together closely on a unique task. The organizational structure that defines departments actually creates a barrier to project communication. Ambiguity about the project leads to faulty transmission of information, and time pressure exacerbates the problem.

Project managers must overcome these barriers. There are some simple things you can do to send messages effectively. Number one, appreciate the position of the other person. How would you feel and think if you were in that role? You know what you want to say; the point is to make sure they understand it. A second important point is to keep people informed on a regular and frequent basis. Constant monitoring and regular feedback are the real keys to success on any project. The plan you develop can be updated using software packages, and the updates made available to all project team members. Remember, small, incremental changes have a much better chance of being understood and properly implemented than large, substantial changes.

The other side of the communication equation is equally important. Most project managers are not very good listeners, even though almost 45 per-

If you want creativity in your projects, recognize it, praise it, and reward it. Few novels, and even fewer scientific articles, are published anonymously.

cent of the time spent managing projects is taken up receiving information.¹⁴ Typically we hear only about one-quarter of this information. Effective project managers know how to listen and how to use information brought to them by team members.

Some simple rules can help you be a better listener on your project:

- Be prepared to listen. You have to want to hear what the other person is saying.
- Stop talking and listen for understanding.
- Put yourself in the other person's position, so you can better appreciate the language and can focus on the message.
- Use the project plan to help you imagine the other person's situation. What is her role in the project? What problems does she currently face?
- If you do not understand, ask questions. Be sure you hear the speaker out before drawing conclusions.
- Remember, no good idea ever entered the mind through an open mouth.

If you are having trouble with communication on a project, try using the "say back rule." It works like this: before you may say what you want to say, you have to "say back" to the person speaking what was just said so that he or she is satisfied that you got the message. If not satisfied, the other person says it again and you must say it back again. This goes on until he or she is satisfied. It works the same way when you are trying to get a point across. When people use this technique, they are often amazed to learn how poorly they hear each other.

- **Build Agreements That Vitalize Team Members.** Conflicts and disagreements on projects are unavoidable. Studies show that project managers spend half their time managing differences.¹⁵ One major reason is that projects require the coordination and integration of work from many different people, most of whom do not usually report directly to the project manager, and most of whom do not usually work together. It is important to recognize that conflict is actually desirable on a project. It ensures continued interest and commitment, and it creates energy. Conflict is borne out of car-

ing; people do not fight about issues they do not care about.

The challenge is to use conflict so that it becomes a force for unleashing imagination and creativity. It is a process to be managed, not eliminated. You have to build agreements that vitalize the project team, and there are a variety of ways to do this. The next time differences arise, use your project plan to analyze the causes of conflict. Then consider the following options for reaching an agreement:

- Give in to the other person if the issue is small for you but large for the other person.
- Smooth over the disagreement by focusing on the goal if the issue is small for both of you.
- Split the difference by finding a compromise if the issue is of moderate importance to both of you.
- Persuade the other person to see your point if the issue is big for you and small for the other person.
- Find common ground from which to bargain and negotiate differences if the issue is big for both of you. Here you *must* find a way for both of you to win—otherwise the project loses.

The task of resolving disagreements is complicated by the fact that the project manager typically does not possess the "power of the hierarchy": you may lack the formal authority that goes with line positions. One way to gain acceptance and build agreement is to provide a sound rationale for your position. Effective project managers tend to be perceived by people in each functional area as knowing something about their discipline and as appreciating their point of view. This knowledge base—plus hard work—can help you create a common ground and build agreement among project members.

One of the important findings in research on project managers is that they sometimes rely *too* heavily on reasoning and logic.¹⁶ You have to realize that negotiation must be used to complement logic. Logical arguments have their limits. Remember that reaching agreement in conflict situations is not only a logical but also an emotional experience.

- **Empower Yourself and Others on the Proj-**

ect Team. Project managers often do not have enough power. How often have you heard a project manager lament, "If I only had the authority to get those people on track." Project managers have to realize that influencing others arises at least as much from personal competence as it does from formal authority. Effective project managers continually work to build the personal power that comes from honesty and integrity.

Managers who have underachieving teams tend to hoard power.¹⁷ On high-performing teams, managers share their power. As a result, people at every level on high-performing project teams feel they can help the project to win. Project managers need to realize that powerlessness causes people to fail far more often than having too much power. When people on the project team feel they have power and authority, and when they feel they can make a difference, productivity improves.

Empowering everyone on the project team leads them to put forth their best efforts. You do not want people to simply comply with your requests. All project members have to do to drive you crazy is "exactly what you tell them to do, no more and no less." Instead, you want them to use their skills, abilities, and initiative. Team members will not take responsibility unless they understand the plan and have some freedom to operate.

Project team members have to receive certain things from you. What people want most from project managers is honesty, competence, direction, and inspiration.¹⁸ These characteristics add up to credibility. When you are perceived as trustworthy, as knowing what you are talking about, as dynamic and sincere, and as having some sense of direction, others will see you as credible. When you have credibility, people tend to comply with your requests and to demonstrate a sense of commitment.

- **Encourage Risk Taking and Creativity.** Effective project managers know that innovation is not simply a matter of selection or training, or even of good fortune. One reason for the absence of creativity on your project could be that people feel inhibited from expressing themselves. Organizations too often stress the consequences of failure, rather than the rewards of success. Thomas Edison is quoted as saying, "I failed my way to success." Would he have survived in your organization?

Effective project managers plan time for thinking, experimenting, and creative behavior. They recognize that the creative process takes time. At

3M, for example, all engineers and scientists are expected to spend 15 percent of their time working on nonprogrammed activities.¹⁹

It may surprise you to know that reinforcement, goals, budgets, and deadlines also facilitate creative efforts.²⁰ Creative behavior, like any behavior, is influenced by its outcome. It requires support and communication. Fostering an open exchange of ideas and promoting exposure to new ideas enhance creative effort. The Eleventh Commandment at 3M is, "Thou shalt not kill a new product idea." If you want creativity in your projects, recognize it, praise it, and reward it. Few novels, and even fewer scientific articles, are published anonymously.

Creative projects do not make for smooth sailing. The most stimulating and rewarding projects are somewhat like a roller coaster ride. You never really know where the dips, twists, and turns will come. You have to enjoy the challenge and feel confident in your ability to stay on the ride through to the end. Like the turtle, project managers make significant progress only when they stick their necks out.

Conclusion

These ten principles for planning and managing projects can help you integrate the technical and human aspects of project management. Following the first four principles will help you develop a sound plan that team members can commit themselves to and that will be flexible. Following the last six principles will help you manage the plan effectively so that you anticipate problems before they become severe and so that you keep team members committed to project success. In combination, the ten principles, if followed, will help you complete projects on time, within budget, and according to desired quality standards. ■

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