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Managing the Value Chain in the Project

Intractable problems are usually not intractable because there are no solutions, but because there are no solutions without severe side effects.

—LESTER C. THUROW—

''Why is management suddenly so interested in plumbing problems?'' one manager asked another as they both read a memo from the vice president.

The second manager looked puzzled. Then he realized what the problem was. ''No, you misunderstood. The memo says that we need to work on our *value* chain, not our *valve* chain.''

The *value chain* is a concept defining levels of both quality control and process management. Just as the better known supply chain has to be carefully controlled to prevent process defects, the value chain also requires careful quality control–related overlays in preventive measures.

The supply chain describes how processes move from beginning to end. It includes descriptions of the responsible person or department at each step, and it shows how work flows from one step to another.

Supply chain is characterized by weak links, those specific times and places where defects are most likely to occur. In quality control processes such as Six Sigma, the definition and scope of a project are often defined in terms of weak links. Most analysis reveals that weak links occur whenever a process moves from one person or department to another. Once you identify these problem areas, likely solutions are much more easily quantified and reached. However, supply chain describes only the movement of process and does not discuss quality along the way. It is an action plan, not a quality-control plan. The study of supply chain is very useful in focusing on weak links and making sure that all steps have been examined. This is why a visual representation of supply chain is valuable, but it is most valuable when it also leads to a second discussion, focused on quality.

Apply the same logic used in the supply chain to the concept of quality, and the value chain can be monitored under the same kind of process. Once you merge supply chain and value chain, you complete the goal of (a) improving processes in terms of efficiency, (b) looking for weak links causing delays or defects, and (c) identifying how and where quality must be improved and focused to make the whole process better in terms of efficiency *and* quality.

Attributes of the Value Chain

The definition of a value chain is determined by the kind of project. If your project involves product manufacturing and the reduction of defects (the original quality control format for projects), then value chain is easily understood. For example, an auto manufacturer wants reduced defects on the assembly line. As noted, companies like Toyota revolutionized assembly line work by allowing anyone on the assembly line to bring the whole thing to a halt if a defect was found. This is where the supply chain crosses over to the value chain.

If your project is more service oriented, the same concepts apply but the appearance will be vastly different. For example, a process to improve internal controls or make processing more efficient is equally concerned with quality control, but the means by which this is achieved will vary considerably. Just as the auto assembly employee can bring

the line to a halt upon recognizing a flaw created by a previous process, the most effective value chain allows for internal self-auditing and cross-auditing of the process. It does this not only to highlight defects, but to ensure that the output quality is of the highest level as well. The identification of flaws and defects—whether product or service related—is the most important attribute of value chain management.

Attributes of this approach to a project define its success. These include:

1. *Value can be thought of as a form of quality, although the two are not always precisely the same.* In some respects, the creation of value within the supply chain shares many attributes with quality, but not always. For example, in a product assembly environment, preventing product defects creates value by reducing waste and speeding up processes. The end result is greater quality. However, in a service-oriented venue, value may exist simply because a process is made more efficient, thus reducing processing cost and time; but this does not mean the end result contains more quality. The distinction is important because in those kinds of situations, there is an important goal: to create more value without a corresponding loss of quality. Greater value exists only when the same or better quality control is maintained.

2. *The value chain requires quality-control measures, but also a customer service outlook.* The value chain is closely associated with the historical idea of customer service. If your project creates a better outcome for customers (better-quality product or service, improved responses to complaints, more focused marketing), then value chain is a quality control system. If your customer is an internal individual or department, then the same outlook has to be applied to grant real value to your project, but this is beyond the scope of quality control.

For example, an accounting department that processes payroll checks has the internal controls and processes in place to ensure accurate calculation of gross pay and deductions, but it still has problems with timing for the release of those paychecks if and when exceptions are presented (i.e., overtime calculations, variances in pay rates, or spe-

cial and nonrecurring deductions). Even in fully automated systems, these typical kinds of exception-based processes become problems if processes are not flexible. So with quality control in place, the required safeguards are going to exist, but the value chain has to be designed so that, beyond quality control (in this example, involving the accuracy of calculations) must be balanced with the equally important expectation on the part of the customer (anyone receiving a paycheck) that payroll checks will be received on a timely basis and consistently.

3. *If you apply the same diligence to value as you do to the prevention of process-related defects and variances, then the entire supply chain works; without this value-based orientation, problems are inevitable.* In many projects, emphasis is placed on steps and phases alone, without adequate consideration of value. This focus on reducing defects and variances may have an unintended consequence. If the end result lacks actual value, changed processes may be less efficient and more expensive; even with improvements in the process, forgetting value often means that projects fail even when safeguards and process improvements are built into the system. This may also be reflected in the difficulty with maintaining changes and improvements after the project is over. When an element of value is incorporated into the new process, you still reduce the defects that were the original project target; you also improve value as an integrated part of the newly revised process. This augments the permanence of the changes.

4. *The effectiveness of the value chain often determines whether improvements to processes are permanent or not.* A real test of how effectively new processes work is the question of whether they remain in effect once the project team breaks up. In spite of what the theories in many Six Sigma and project management texts claim, the changes are not permanent just because a project changes the process. The key to ensuring that improvements are kept in place rests with the value chain. When the steps in a process are incorporated with the concept of value (customer service in addition to process integrity), those responsible for execution of each step are more likely to keep newly implemented procedures in place. Most employees, whether

working on product-related output or services, want to reduce defects, for two reasons. First, everyone wants high quality, as a matter of simply being effective on the job. Second, people realize over time that low-quality output inevitably means processes return and have to be fixed, resulting in more work for less result, and people usually do not want to have to do anything twice or spend more time and effort going over the same processes twice.

5. ***Effective value chain naturally makes the whole process easier, not harder.*** Some resistance to change has to be expected, and a project manager's greatest challenge may be to get others to go along with changes, even small ones. In fact, resistance to change often is not only a challenge; it may also be a stumbling block that can defeat the project before it is even implemented. The irony is that people resist change because they see it as a complication in their routine. With this in mind, one of the most important points to remember in the design of a project is this: An effective value chain reduces the work-load and processing burden. The assumption that change and complication are indistinguishable is wrong, as long as value is built into the process.

For example, information technology (IT) has made some processes complex because a different set of risks come with the change. It has made everything much easier as well by removing the detail orientation of repetitive functions and routines. So much more data is processed much more quickly and with greater accuracy before IT was widely applied in work environments. The processing burden has been reduced even though some complications have arisen. Any process that includes a greater value element is going to simplify the whole process. Even when this simplification changes the risk structure and internal controls, it remains a simplification. Part of your project management challenge is going to be to demonstrate to the stakeholders and end users why change is actually an improvement in their processing lives. That is the real challenge.

Risk Management and the Value Chain

The value chain is specifically intended to reduce risks, prevent them, and anticipate possible future risks. On a large scale, catastrophic losses

cannot be insured against or transferred, so steps have to be taken to mitigate the risks. For example, IT files can be duplicated off-site, the labor force can be diversified by location, and internal emergency drills can be put in place for natural disasters (notably in areas known to experience hurricanes, earthquakes, or tornadoes).

On a small scale—for example, as part of the structure of the project focused on relatively concentrated processing—a few basic risk management principles help to (a) reduce losses, (b) avoid variances and defects, whether product specific or service related, and (c) create greater overall quality (higher Sigma) by integrating quality into the value chain while creating a risk management approach.

Some essential risk management principles can help to incorporate value into the project and related processes. These include five specific points:

1. *Recognize that all processes contain risks.* No process can be designed completely risk free. Even if you mitigate, insure, and transfer all of the risks you can imagine, you still are exposed to the unimagined risk, to system failure, and even to intentional sabotage circumventing your controls. The best you can do is to anticipate as many known risks as possible and then take steps to avoid or reduce them. Safeguards like the use of safety glass, highly recognizable colors on steps, and self-locking ladders are good examples of small and simple ideas that reduce accidents. Apply the same principle to the entire process to address the reality that risk is universal.

2. *Plan for the worst-case scenario.* Many organizations have adopted a passive approach to risk, often citing budgetary limits for the decision. Although financial limitation is a reality, it is often not tied to the prioritization of risk. There are many risks a company simply cannot afford, and not every threat can be insured against or transferred to vendors and subsidiaries. Your plan within the project should be to anticipate the worst possible outcome. Knowing that you cannot do away with every possible risk, you can place control systems and safeguards at least to reduce the level of risk.

3. *Try to imagine risks that no one has even considered.* Many catastrophes occur because no one was able to imagine the

threat. This has been one of the devastating lessons of 9/11. No one ever imagined an assault using commercial airliners, and as a consequence no one planned for it. On that day, first responders discovered, for example, that fire and police units could not communicate with each other because their equipment was not compatible. There was no plan in place, nor was there a policy, for deciding what kind of military response was to be made if additional planes were in the air and headed for targets. The list of ways that no one was prepared is long. The lesson can be applied in organizations as a factor in long-term, organizationwide planning. As a project manager, you can also improve your risk management skills by trying to imagine scenarios beyond the common and the usual.

4. *Match risk mitigation controls to the level of risk.* Prioritize your risk management decisions within the project to match the highest threats with the most extensive steps. In risk management, prioritizing is the only way to intelligently mitigate loss. You cannot plan for every conceivable risk, and, even if you could, the comprehensive program would be cost prohibitive. So a two-part approach to prioritizing is needed.

The first part is to evaluate a threat level, based on the likelihood of an event. For example, it is quite likely that a strike will disrupt manufacturing, transportation, and other phases of the supply chain; it is much less likely that a pandemic will close your offices and plants. So you would probably prioritize risk mitigation initiatives to reduce the impact of a strike (by creating additional inventory for essential products or diversifying supply sources, for example), and assign a lower priority to reacting to a pandemic.

The second part is to prioritize the cost element of mitigation and prevention. Steps like insuring against loss are part of this, but only a small part of the total response. Any risk that is both cost prohibitive and unlikely to occur will probably not be given high priority; those more likely to occur will be given higher priority, but limited to cost-effective measures.

These prioritizing steps are applied throughout the organization; but projects can also be subjected to the same kinds of analysis. The

combined likelihood and cost associated with a threat are going to determine how you need to address risk management. Some projects are going to be chronically high risk. For example, in a manufacturing plant, the risk of accident is going to be quite high; in a clerical setting, it is quite low.

5. *Incorporate risk mitigation as a permanent part of the process.* As project manager, the challenge is not limited to identifying and preventing or mitigating risks. It extends to how you can incorporate risk management into the entire process, not as a function but as an integrated part of a newly developed process and as part of the control procedure itself. Many risk initiatives start out working brilliantly, but once management moves out of the picture, those mitigating steps are ignored or dropped. The safety devices come off, exact procedures are shortened, and internal controls are not taken seriously. By developing risk management processes as part of the process itself, it is more likely that the benefits will be made permanent.

How Value Is Incorporated into the Big Picture

One of the great advantages of Six Sigma is its two-part application. It is a quality control and project management system with a highly structured approach to fixing problems. It is also a cultural point of view. According to the philosophy of Six Sigma, everyone in the company, regardless of rank, is on the same organizational team. So widespread objectives, quality standards, and processing goals are at the base of every project organized under the Six Sigma ideal. Value itself becomes part of everything done in the organization, and projects are always based on the assumption that value is going to improve as a result of the project.

This ideal can simply be empty words, or it can serve as a new way to approach project challenges. The distinction relies on project leadership, organizational morale, the degree of team spirit (whether as part of Six Sigma or not), and a willingness to work together to reach clearly stated organizational goals.

Each of these deserves a closer look. As a project leader, it is not enough to ensure that team members respond to your directives or efficiently execute the steps you assign. So, although *project leadership* is an essential element, it is only the means by which additional steps can be put into action. A leader needs to understand the elements of leadership that define the difference between success and failure; having the authority to lead your team is necessary, but it does not mean you will succeed as a leader. True leaders need to inspire team members and motivate them to adopt the teamwide goals. Of course, those goals have to be expressed clearly to the team. If a team leader closely guards the real goals of the project, it is not reasonable to expect team members to actively participate in accomplishing those goals. Many project managers discover that a large part of their job is motivating members through the constant definition and clarification of team-based goals.

A second essential element for incorporation of the value ideal rests with *organizational morale*, or the attitude of each team member. If employees are cynical or resentful toward management, every project is going to be difficult to execute successfully. Low morale is not only a damaging flaw within the organization, it is infectious as well. It becomes a self-fulfilling prophecy once poor attitudes begin, ultimately destroying incentive. When morale is at its lowest, even positively minded project leaders will have great difficulty instilling a positive, results-oriented mindset among the team. It is not impossible, but it is difficult. At such times, creating a pocket of focused teamwork is the only way to cure the morale dilemma.

Low morale is a problem for management in the sense that the symptom often results from a distance in communication between the boardroom and the rank and file. If employees sense that executives are overpaid, ineffective, and insensitive to their needs, morale is going to suffer. One of the most effective historical attributes of Six Sigma, notably as a method for executing projects successfully, has been the improvement of organizational morale. This is accomplished by removing organizational rank from the team approach. As a revolutionary idea, this may seem extraordinary; as a means for efficiently offsetting low morale, it has been very effective. The multiyear experience at Gen-

eral Electric when Six Sigma was the accepted way of operations could be expressed in terms of dollar savings (and often is), if only because the bottom line is the best known method for quantifying management effectiveness. But there was more. The internal communication was vastly improved in the Six Sigma culture, and this ensured high morale. So whether you operate within Six Sigma or not, the key to overcoming low organizational morale is to instill the cultural team approach to projects.

Organizational morale also determines the level of *team spirit* within your project team (as well as within your department, operating unit, and overall organization). Team spirit can make project management an entirely satisfactory and joyful experience, because it assumes that everyone is working toward the same teamwide and organization-wide goal. The opposite is suspicion and lack of communication with conflicting goals within the team itself (for example, when the team members perceive that a project leader is using the team to advance personal career goals or to claim all of the credit for the team's efforts). Team spirit is often viewed as the defining feature of a well-led team, and new people can dispute this claim. Effective leadership—whether of a team, a department, or a platoon—requires that the entire team evolves through mutual trust and respect and that there is complete agreement in defining the immediate and long-range goals of the team. In combat, a platoon functions as a team when every member protects the others, when the short-term goal is survival, and when the long-term goal is defeating the enemy. In any organizational environment, the platoon analogy is easily expressed and well understood, although the short-range and long-range goals are normally more complex and layered within the team's function and interaction to departments and often competing organizational interests. So if a team's work is perceived as a threat to a department, the affected supervisor may resist change and operate with anything but team spirit. At this point, your task is to demonstrate how and why the project represents positive change (greater efficiency, less repetition due to lower occurrence of defects, improved value chain on many levels).

Finally, value chain is incorporated through *working together* both within the team and with outside-the-team stakeholders. The concept

of working together is not the same as team spirit. Team members may have the spirit but experience difficulty working together. Invariably, the team (even when working together) will confront resistance from outside. So as project manager your task includes getting the team to work together as an integrated unit and getting outsiders to work together with your team. This dual challenge can be daunting, especially when neither the team nor the stakeholders are cooperating, or when everyone is unhappy with your proposed changes.

You get the team to work together by developing specific schedules and assigning duties to team members and subteams. Following up to ensure that everyone is aware of how their processes affect other team members is also important. Depending on the scope of the project, this may require continual reinforcement on your part. Working together does not always come naturally to people, and a team will often operate in a self-destructive mode rather than trusting other team members. This phenomenon is described by a behavioral concept known as the ''tragedy of the commons.'' This concept, first published as an article, describes group behavior when individual interests are in play.*

Here is how it is described using a metaphor: A number of herders share a common piece of land, where they are allowed to let cows graze without restriction. Each individual has an incentive to graze as many cows as possible, but overgrazing ultimately destroys the pasture and none of the herders has access to it anymore. A sensible approach would be for the herders to work together by agreeing to a self-imposed limitation on the number of cows that will be grazed. The tragedy arises in observing that it takes only one herder to destroy the whole plan.

With this in mind, you as project manager can easily see how self-interest will quickly destroy the team and its efforts. As part of building a value chain within your project and its outcome, it is going to be essential to apply enough leadership to overcome self-interest among the ''herders'' on the team. The trust required for this has to come from you as project leader; human nature is going to be in play, and self-

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*Garrett Hardin, ''The Tragedy of the Commons,'' *Science*, Vol. 162, No. 3859 (December 13, 1968), pp. 1243–1248.

interest (saving a job, seeking a promotion, avoiding blame) is destructive to working together.

The same problem applies outside your team. A supervisor or manager who perceives your efforts as threatening to the department needs to be shown how the value chain is both beneficial and efficient. A middle-level manager or supervisor is constantly beset with inefficiency, inadequate budgets, time constraints, and other limitations. To turn a potential enemy into an ally who will gladly work together with you and your team, you need to demonstrate how your project will improve value, cut down on time and labor, and improve overall quality. Just as the herders in the illustration of the tragedy of the commons are going to act in self-interest unless enlightened with the facts, a manager or supervisor can be converted to an ally *only* by showing how your project is beneficial. As long as it is perceived as a threat, the project cannot be fully successful. This only increases the potential that any changes you institute will be reversed after your project is completed. Success is going to require allegiance among all stakeholders; success has to be measured in the long term and by the permanence of change. If you think of managers and supervisors as herders, your task is to demonstrate how they have to work together to save the commons (common interests) affecting their herd (the department).

Value: An Intangible Turned into a Tangible

How do you measure the effectiveness of the value chain your project creates? In every organization, methods for quantifying success are the key. Managers rely on budgets and remaining within them, marketing departments create and follow revenue-based goals, and military units track battle results. All of these measuring devices are used to decide whether projects succeed or fail.

The value chain may be intangible, but you can measure results by selecting the tangible changes that serve as intended targets for improved processes. So the value chain can be made into a tangible and measurable attribute of your project; this is essential not only to mea-

sure results for yourself and your team, but also to demonstrate to management how your results have worked.

Here are some guidelines for quantifying the value chain:

1. *Suggest in advance how success is to be measured.* The best time for definition is at the very start of a project. In addition to the tasks of setting a budget, preparing the preliminary completion schedule, and choosing a team, recommend methods for measuring the success of the project. Select not only the desired final outcome, but periodic accomplishments you intend to reach at phases throughout the course of the project. These interim and final goals present management with a method for determining the degree of success and provide you with specific goals.

2. *Develop tracking methods to ensure that value measurement goals are being met.* Just as a budget is tracked by variances to judge its effectiveness, a project is best judged by measuring its progress against a specific series of goals. These may consist of completion deadlines for major phases, the determination of the sources of variances or defects, and the implementation of new procedures and controls. By setting goals and then tracking progress, you are able to both quantify and define the value chain throughout the course of the project.

3. *As the project moves forward, look for additional value chain measurements.* No matter how thoroughly you define the elements of your project, it will evolve and change as you begin executing its phases. Most projects evolve in this way. Project managers face the task of adjusting schedules and budgets and, on occasion, team members—all due to the evolving nature of a project. While this is taking place, also look for additional ways that the value chain itself has to be measured. As projects change, so will the definition of value and of the value chain.

4. *Match value chain–based outcomes to expectations as a method for defining success for every project.* Also remember that, as the value chain takes on shape and definition, outcomes are going

to vary as well. Be sure to match these changing criteria to the methods by which you measure success. You are going to discover that some project goals will change as you discover new value chain elements, and flexibility is crucial to ensure that the project succeeds.

5. *Don't be afraid to make changes, even to project goals.* One of the pitfalls in project management is to begin with a set of assumptions and goals that are not realistic. As your project moves forward, you are likely to discover that new and unexpected requirements arise, demanding new controls, procedures, and value chain definitions. The most logical step is to boldly document these variations and communicate them to management, recommending revised outcome expectations. Effective project management demands flexibility, not only in terms of the well-known budgets and schedules, but also of the value chain and final outcome.

Value chain management is really nothing more than ensuring that the steps you take to implement improvements are sensible, profitable, and efficient. The definition of *value* itself requires these elements as well as permanence. A project makes sense only if well-designed changes remain in effect after the project team disperses.

WORK PROJECT

1. Describe how value chain and quality are similar, as well as how they differ from one another.

2. Explain the importance of organizational morale in relation to how value is added to the project.

3. Describe why suggesting in advance how a project's success can be measured is a smart idea.

10

Writing the Supporting Documentation

If a cluttered desk is the sign of a cluttered mind,
what is the significance of a clean desk?

—LAURENCE J. PETER—

Two project team members, exhausted after a week of working against deadline, were still in the office at 7:30 P.M.

''I'm having trouble following this network diagram,'' the first one said. ''I feel like a rat running through a maze.''

''That explains it,'' the second one replied. ''All week, I've had a craving for cheddar cheese.''

How do you manage a project when you also have to train core team members as you proceed? Imagine this: You have constructed a detailed network diagram and tied down all of the loose ends for your project. Your team members know what you expect, but they are confused by the complexity of the diagram itself. In other words, rather than studying concentrated areas of responsibility and looking at the steps in each box, they are overwhelmed by the entirety of the diagram

itself. This problem persists even after you get people started. Team members are not sure how they are supposed to execute their tasks.

The network diagram only identifies the sequence of execution, shows where weak links occur, and lists what each team member will do and when. But even if you pick the most qualified team members, you may need to supply more information and exercise more supervision. You cannot just list out the duties and expect them to be completed. This is especially true when:

■ *Your team includes inexperienced people.* You cannot assume that every project team is going to consist of experienced self-starters. It is more likely that even the seasoned team member is going to require some degree of supervision. If the team members' tasks are different from their departmental routines, training will also be required as a part of the process. Just as you work directly with your departmental employees, you will have to allot time to work directly with team members, helping them to understand the specific steps to a task or guiding them through an entire phase. If the supervision and training demands take time away from monitoring and other duties, you could run into a scheduling problem.

■ *The project is exceptionally complicated.* Some projects are more technical than others. Even when you do not expect to face difficulties, they may arise because you did not anticipate them. Even when core team members possess a particular array of skills, they may not know how to apply those skills in an especially complicated situation. In those circumstances, you will need to spend time working through the problems with team members.

■ *You have a very specific idea.* You want to complete your project in a specific manner to achieve the desired end result (e.g., a report) that best responds to the assignment. In such a case, you need to plan well ahead so that each team member's contribution is aimed at the result you want and isn't just executed in the most expedient way. In addition, you need to ensure that team members approach tasks using the standards you have set. For example, in studying a set of statistics from a study, you must ensure that interpretation of results

is managed in an unbiased manner. That requires the application of strict standards, further requiring close supervision.

■ *Your team consists of employees from several departments.* When you work with a team of employees from your department only, you can supervise their efforts directly. This occurs when a project is assigned within one department, which is a common occurrence. However, when your core team includes people from several different departments, or when they are from other divisions or outside the company altogether, it's not as simple. You may have to provide instructions in far greater detail when you do not have daily contact, to ensure that deadlines are met and that contributors understand their assignments.

Project Narratives

When team members need supervision and training, you can save time by preparing narrative instructions. These narratives do not need to be extensive; you certainly won't have the time to write a 100-page training manual for a three-week project. Narratives are needed only for especially complex tasks within a phase. At times, a short list of steps or results is all you need.

Instructions are helpful for core team members who otherwise would not know how to complete a task. Just as employees in your department sometimes need more than the average amount of supervision, core team members cannot be expected to always perform tasks without problems.

Example 1

One phase of your project calls for the design of a simplified form. You know your team member is familiar with this process because she has designed forms in the past. Thus, you do not need to write an extensive narrative of instructions. However, you may need to write down a list of guidelines for such information to be captured on the form. It may be very brief. For example, your instructions might be written as follows:

Design a new form, capturing the following information: name, date, description of the order, part number, brief description, number ordered, price, and total for each list; plus subtotal, tax, and final total. Please also submit your draft of the form for review and approval.

When you work from the network diagram, consider the need for narrative backup at each step. To reduce the volume of extra material and work, keep narratives as short as possible, and avoid explaining the obvious. Describe processes or provide guidelines only when steps are not self-explanatory or when you expect questions to arise. Remember, too, that no matter how carefully you develop narratives, you must still provide direct supervision and support in many instances.

Your core team members will find brief narratives helpful and reassuring as they proceed, especially when they are not accustomed to working from a network diagram. Many projects are executed haphazardly, with few controls and without the organizational support that a diagram provides. Thus, expect to run into resistance to the diagram itself. People tend to resist structure when they are not used to it, and until your team members are trained to think in terms of sequence and process, they won't be comfortable working from the diagram.

It often is necessary to describe the entire project even before your team is selected since you will not know how to compose your team until after a preliminary network diagram has been done. Don't make the mistake of picking a team first and then altering the work to fit the team—assuming you have the luxury of approaching the project more logically. It makes more sense to pick your team only after you know what skills are required. In practice, however, you may have a team imposed on you (as discussed in Chapter 3). In that case, you will have to train people to execute the tasks required for completion of the project.

The organized approach is especially helpful when your team is selected first; then the combination of network diagram and narrative instructions is an excellent training tool. For example, a project may be assigned to you and your department without authorization to recruit

team members from outside. As undesirable and inflexible as this might be, it is unavoidable at times.

In such cases, narrative guidelines should be provided specifically for a task and for the person involved, not for the entire phase. Don't confuse team members by trying to cover too much material in a single narrative. Take it one step at a time, and carefully cross-reference your brief narratives to the appropriate box on the diagram.

Example 2

You are managing a project to revise procedures in a processing department. During one phase, two different team members will be working at the same time to design a new form. One will gather information to go on the form, and the other will draft the form itself. Your goal is to write brief narratives explaining how you want the job done. Your first draft reads:

> Design a new form. Arrange information in the same order found on source documents, using the information supplied by the team member gathering information. Submit your draft to the project manager for review and approval.

This instruction is likely to confuse both team members because the two tasks are described in a single paragraph. Different activities are being described at the same time. Consider breaking out the procedure into Work Breakdown Structure (WBS) outline form, which can be expressed as follows:

Design a New Form

    Team Member 1
        A.   Gather information:
            Refer to source documents to identify the sequence of information. List the sequence and submit to team member 2 for form design.

Team Member 2
B. Draft the new form:
Draft a new form listing information in the sequence provided above. Strive for simplicity.
C. Obtain approval:
Submit the draft to the project manager for review and approval.

In the redrafted version, this project phase is presented in a logical sequence. It distinguishes the steps involved and separates out the duties by team member. Each activity is listed as a separate step and should correspond to a box on the network diagram.

More Than Paperwork

You might begin your project believing that the people on your team are capable of executing their tasks without additional training or supervision. But while they may possess the skills that brought them to your team, they often will need clarification—especially when processes are complicated. This is likely to occur when multiple tasking is going on, or when your diagram contains a loop, a point where processing could proceed in more than one direction.

Team members are likely to understand processing steps when one step follows another in a single line. However, confusion arises when one of three loops shows up on your network diagram; this is where brief narratives are helpful.
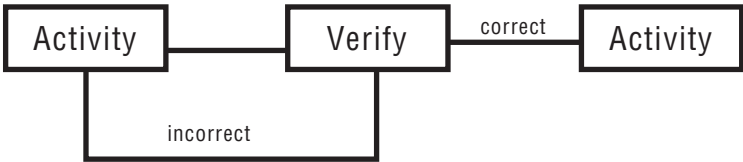
A loop requires a positive or a negative response: correct/incorrect, yes/no, or complete/incomplete, for example. Loops occur in three broad circumstances, as shown in Figure 10-1 and explained here:

1. *Verification loop.* This occurs when a team member needs to check information before proceeding. The ''verify'' step results in something being correct or incorrect. Work does not proceed if the verification shows something to be incorrect; it is necessary to go to the previous step and repeat the activity that was checked.
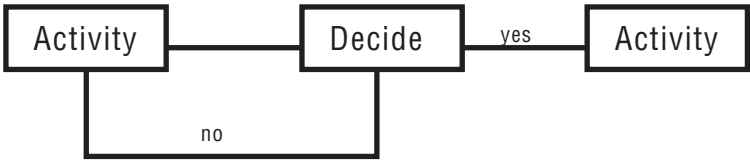*Example:* At a point in your network diagram, you show a loop in
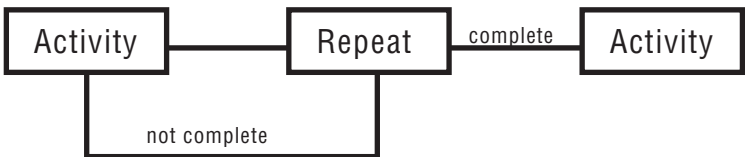
Figure 10-1. Three types of loops.

VERIFICATION LOOP

```
┌──────────┐          ┌──────────┐  correct  ┌──────────┐
│ Activity │──────────│  Verify  │───────────│ Activity │
└──────────┘          └──────────┘           └──────────┘
      │                     │
      └─────────────────────┘
            incorrect
```

DECISION LOOP

```
┌──────────┐          ┌──────────┐   yes   ┌──────────┐
│ Activity │──────────│  Decide  │─────────│ Activity │
└──────────┘          └──────────┘         └──────────┘
      │                     │
      └─────────────────────┘
               no
```

REPETITION LOOP

```
┌──────────┐          ┌──────────┐  complete  ┌──────────┐
│ Activity │──────────│  Repeat  │────────────│ Activity │
└──────────┘          └──────────┘            └──────────┘
      │                     │
      └─────────────────────┘
         not complete
```

the form of a question. The box reads, ''Is the balance correct?'' Two lines proceed from the box. If the answer is yes (meaning the balance is correct), the process moves forward. If the answer is no (meaning the balance is incorrect), the process goes back to the previous step where the error is found and fixed. To supplement your network diagram, you write a brief narrative of the decision point. It reads:

> Is the balance correct? Check the balance on the worksheet by cross-footing. If it is correct, go to the next step. If the balance is not correct, return to the previous step; check the numbers transferred to the worksheet; and add once again to find the error.

2. *Decision loop.* The decision step is a common occurrence in projects. A yes response takes the process in one direction; a no response sends the process in another direction.

Example: At one step, the team member is asked to find historical information. The question reads, ''Is the information complete?'' If the answer is yes, the process moves to the next step. If the answer is no, a secondary process is required listing necessary steps to find and compile information before going forward.

In some cases, the decision loop involves possible consultation with someone else.

Example: Upon completion of a rough draft of a new form, the team member submits it to you for review and approval. If you approve the form, the process continues. If you want changes, the team member needs to revise and submit another draft. Your narrative for this situation might read:

> Submit the rough draft for approval. Present your rough draft to the project manager. If the manager approves the design, proceed to the next step. If the manager suggests changes, return to the previous step (''Design a new form'') and make revisions as indicated. Then return to this step.

3. *Repetition loop.* This takes place when an activity is repeated more than once. The loop response is either ''complete'' or ''not complete.''

Example: A step calls for documenting tasks for each of three people in the department. The activity is applied to each series of tasks and is repeated three times. Thus, a repetition loop is used on the network diagram. Your narrative might read:

> Document tasks. Write brief descriptions of the tasks executed by the first person in the department. Repeat this step for the second and third persons as well. When all task descriptions have been completed, proceed to the next step. If all task descriptions have not been completed, repeat this step.

If loops confuse team members, clarify the idea by accompanying each loop instance with a narrative explanation. The narratives are not part of the network diagram, but are supplemental. Be sure to separate each set of narratives by area of responsibility to maintain a separation between duties and to keep each team member's activities as clear as possible.

Your goal should be to ensure that all core team members are able to follow their areas of responsibility on the network diagram and have the added support of narrative assistance when and where needed. This enables them to complete tasks with a minimum of supervision.

Simplifying Instructions

For some projects, you will need to develop very little in the way of narrative support. But for others, you may need to supply core team members with complete and extensive instructions. Base your decision on the mix of people on your team, the complexity of the project and its phases, and the level of concurrent activity.

Example 1

You manage a project with twelve team members. As many phases will be under way at the same time, so your network diagram is especially complicated. In this case, narrative support can help clarify each core team member's responsibility, steps, and timing. And because each ac-

tivity section begins and ends with weak links (i.e., processes moving between areas of responsibility), those links can be easily planned for in advance.

Example 2

You manage a project with only a few team members, all of whom work in your department. There are only a few instances of concurrent phasing. You supply narrative support only in those areas of exceptional complexity, or where you have specific requirements that you want met.

. . . .

The purpose of narratives is to provide more detail than team members have with the network diagram. The diagram places each step and phase in perspective and shows the team members the overall scope (as well as their specific contribution). This is valuable when team members work in relative isolation from the overall project processes. The network diagram provides team members with perspective and gives the project a visual character. Very seldom will a group of people sit in a room and work together. It's more likely that teamwork proceeds when people or groups break off and execute phases on their own—coordinated as part of the whole but working alone.

The reality of teamwork such as this challenges your leadership abilities. You need to ensure that your team members share their collective duties and work well together; you must also explain how each member's part fits in the big picture. The network diagram illustrates this in the best possible way—by showing the critical path process while breaking out individual areas of responsibility. Wise leaders know that the best way to lead is to help team members feel included in the larger scheme of things.

To tie the network diagram to step-by-step narratives for the more complex portions of work, it helps to reproduce segments of the network diagram next to narrative descriptions. This approach gives you and your team several benefits:

■ *It makes the flowchart easier to read.* We retain information gathered visually more readily than information obtained from narratives alone. The network diagram is visual because it imposes a pattern on the project and its phases. If narratives are separate, your team has to connect one representation of the process to the other. By reproducing the visual and narrative in the same place, retention is improved vastly.

■ *It identifies each step directly.* Team members may be intimidated by the scope and complexity of their tasks when reviewed in diagram form alone. But when they are broken down and addressed directly as single steps in the process, team members can develop greater confidence in their ability to respond.

■ *It reverts to vertical steps.* People are accustomed to thinking of processes in top-to-bottom form. This is why vertical flowcharts are comfortable and familiar to most people. As inefficient as the vertical flowchart is, people may comprehend their steps more easily when the horizontal version is elaborated upon by combining it with a vertical workflow and narrative.

The Diagram/Narrative Combination

The complex network diagram can be converted into a fairly simple series of steps, divided into specific areas of responsibility. This improves the team's comprehension and summarizes individual tasks and roles. The problem is that extensive summaries take time to create, so they should be used only for the more complex segments of the process.

Example 1

One phase in your project is entitled ''Prepare worksheet.'' This phase includes a verification loop. The steps are depicted in Figure 10-2.

Anticipating that some team members may find the steps to follow confusing, you write narrative explanations of the process. To help in tracking the steps, you reproduce the boxes from the diagram next to

Figure 10-2. Verification loop.
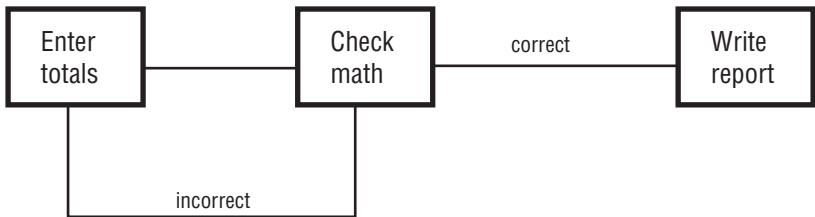
the narrative descriptions. An example of this technique is shown in Figure 10-3.

Notice how the horizontal steps on the network diagram are duplicated vertically in the narrative section. People are comfortable with top-to-bottom flowcharts because that is how they read; this technique conforms to the familiar learning pattern while preserving the advantages of the flowchart. By breaking out a small portion of the network diagram and isolating it along with narrative support, you help team members to overcome confusion and to more effectively master the use of process flowcharts.

Treatment of the loop is also easy to follow. In the diagram, the loop is probably the most confusing part, because the process splits and team members have to decide how and why and what they need to do at that point. The narrative/diagram combination explains and clarifies the process for the team member.

The narrative/diagram combination is also useful for elaborating upon weak links and bringing them to team members' attention. Because narratives are prepared for each team member individually, they tend to begin and end with weak links. So one area of responsibility takes up where another finishes.

In the previous example, the team members start to prepare the worksheet upon receipt of a report from the accounting department. And when the worksheet has been prepared and a subsequent report written, that work is passed on to the project manager. The beginning and end points of this process are weak links.

The narrative supplement helps every member of your core team to manage these weak links because:

Figure 10-3. Narrative/flowchart combination.

Refer to the report submitted by the accounting department. It lists the totals of estimated transactions processed by the five processing departments in our division.
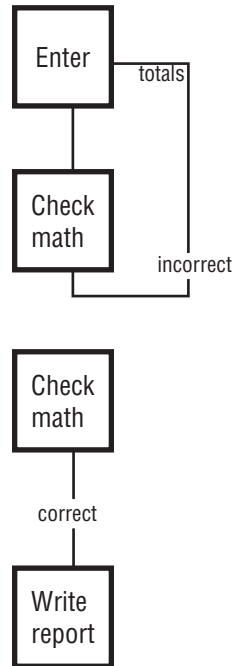
Enter the totals from the accounting department report on the worksheet you are preparing. The information you enter should correspond with the column heading you wrote in previously.

When you have completed that step, check the math for each column and for each row. Make certian the worksheet is in balance.

If the worksheet is not in balance, return to the previous step. Check each number against the accounting report. Locate all errors and correct the worksheet. Check math once again.

When the worksheet is in balance, proceed to the next step.

Write a report summarizing the information entered on the worksheet. Submit the report to the project manager for review. Include the worksheet with the report so that the manager will be able to verify the information.

```
┌─────────┐
│  Enter  │──── totals
└─────────┘         │
     │              │
┌─────────┐         │
│  Check  │         │
│  math   │──── incorrect
└─────────┘

┌─────────┐
│  Check  │
│  math   │
└─────────┘
     │
   correct
     │
┌─────────┐
│  Write  │
│ report  │
└─────────┘
```

■ The process itself cannot begin until the previous steps have been completed and passed on.

■ The process is not complete until the last step, which often involves passing results to the next person or area of responsibility.

As project manager, you will find that the easiest way to control the schedule is by tracking the timeline on the network diagram. The visual summary is helpful as well, because it helps you track progress for the entire project, no matter how many concurrent phases are under way at the same time. Many scheduling problems come as a surprise when it's too late to help team members work through them; the network diagram helps you to prevent that.

Project Control Documentation

Because every project is different, no exact level of documentation is going to be appropriate in every case. It has to be dictated by need. In some cases, you will need a very formal, elaborate series of documents that show not only the progress of activity, but also define areas of responsibility. This can help to avoid overlaps in execution, especially when your project team is spread out over several different departments and includes a large number of people.

In that case, overall documentation will be similar to engineering specifications. Several levels of definition are required for the larger project: responsibility for each phase, scope of their responsibilities, materials they will need, appearance of the end result, and interim deadline. This requirement is made more complex when team members act as floaters among several different areas of responsibility. These areas are not always fixed and permanent but may evolve from one phase to another. This complicates not only the team's actions, but your role in coordinating the whole project.

With exceptionally large project teams, phases have to be broken down according to their complexity. In some cases, you need to assign primary responsibility to one team member as well as secondary roles for others. The schedule may require considerable detail in these circumstances, and additional support may be helpful in the form of a detailed WBS outline, Gantt chart, and Critical Path Method (CPM) diagram. These additional tools should be coordinated with a more summarized version of sequence and deadline, expressed on the network diagram.

The especially complex project—one taking up many months and demanding a large project team—is better defined and controlled with narrative support that's helpful enough so that all team members know what is expected and how they should proceed.

Example

Your project requires the development of procedures for a department currently processing information manually. This department has been passed over for automation because it deals with many exceptions. Other than document production, which is automated, the processes in this department involve special problems and exceptions. However, the time has come to automate, given increased volume and work activity. The company wants the department automated within six months, and your project will achieve several end results:

- Definition of required input formats and expected monthly transaction volume

- Procedures for input, verification, and documentation

- Design of input and control forms

- Design of database elements

- Design of reports drawn from the database for an array of reporting and follow-up requirements

- Procedures for retraining of employees

Team members for this project will include several people from the subject department, members of your department, and a systems analyst. You will also work with outside consultants. You will need to develop narrative support on several levels, including:

- Instructions for your project team relating to the gathering of information about current procedures and system requirements

■ Methods to be employed in drafting initial results and submitting them for approval

■ Guidelines for writing new procedures, designing forms, and communicating with the systems analyst and technical staff

Because this project involves team members working in other departments (and outside the company), it is critical to define areas of responsibility with great care before getting into the process. You define areas of responsibility in three ways, according to:

1. *Type of work.* An employee in your department will be responsible for drafting the database files for the new system, working closely with the systems analyst and the outside consultant. Another employee from your department is given a series of tasks relating to the design of forms.

2. *Individuals who possess special knowledge or skills.* The systems analyst plays a pivotal role in this project because development of new, automated procedures are involved. Employees in the subject department, by virtue of their jobs, know what has to be accomplished and can assist in defining how automation can continue to meet the department's needs.

3. *Phases of the project.* A phase, by its nature, dictates which individuals on your team should be given a specific responsibility. When the team is large, you must delegate, choosing team members to act in primary roles and supervising the work of others.

· · · · · · · · · · ·

The documentation you create, whether very limited and brief, or detailed and extensive, helps you monitor your project and remain on schedule. Hopefully, it will also assist in defining areas of responsibility well enough so that each core team member knows exactly what you expect, when and how it needs to be completed, and how to proceed with minimal supervision.

With the proper documentation—notably a combination of a network diagram and narratives where required—you have the tools to successfully lead your project team toward timely completion of its work. To ensure this, you also need to develop systems for periodic review, including progress reporting, deadline control, budget reporting and variance corrections, and actions designed to make up early delays later on. Project review is the topic of the next chapter.

WORK PROJECT

1. You are writing narrative instructions for a project phase involving two team members and a decision step. The sequence of activities is as follows:

- ■ Team member 1 prepares an outline of tasks and gives the outline to team member 2.
- ■ Team member 2 reviews the outline. If he has any questions, he meets with team member 1 and asks for more information.
- ■ Once team member 2 has the information needed, he prepares a step-by-step flowchart of the procedures.

How would you combine narratives with activity and decision boxes to describe these steps for each of the two team members?

2. Describe the typical features of:
a. Verification loops
b. Decision loops
c. Repetition loops

3. Describe and explain three ways that areas of responsibility are defined in a project narrative document.