The Triple Constraint — Friend or Foe?

By Denise DeCarlo, PMP

Many people have heard of the triple constraint, but do you *really* leverage them? The triple constraint is defined as Scope, Time and Resources, each representing the sides of a triangle, as shown in Diagram A. Scope refers to the necessary work to be performed in order to produce the desired project results. Time, of course, is defined as the duration of time it will take to complete the defined scope of the project. Resources include the money and effort expended on people (labor), services and products (for example, the purchase of hardware, building materials, software, manufacturing components, etc.). Leveraging the triple constraint by determining a distinct priority of the components, and managing the project to that prioritization, can enhance the chances for project success.
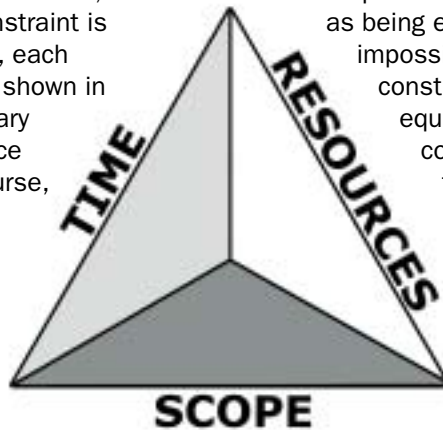
Diagram A: The Triple Constraint

Prioritizing the Triple Constraint

At the beginning of the project, ask your project sponsor to prioritize the triple constraint components. Frequently, he or she will say, "They are ALL important." They are, indeed, all important, but they should not be treated equally! Undoubtedly one of the elements of the triple constraint is more important than the others. For example, is the end date non-moveable due to other business commitments, regulatory considerations or mandatory stipulations? Or, is the budget fixed and your project absolutely cannot exceed the approved budget level? Or, is scope critical because you are attempting to obtain a competitive edge and your company wants to be the first in the marketplace with a given product? Find out from your sponsor which component of the triple constraint is most important and why, which is second most important and, finally, which is least important.

As the project manager, you will make decisions every day based on the priorities of the triple constraint. If your sponsor has indicated to you that the end date is the first priority, followed by resources and then scope, you will do anything possible to complete the project on time by first reducing scope, since it is the lowest priority of the three, and then by incurring additional resources to ultimately meet the desired end date.

This may seem basic or obvious, but all too often we don't have this conversation with the sponsor and the project manager either assumes a priority of the triple constraint based on perceptions of the situation, which might be wrong, or, worse yet, the project manager attempts to treat all three triple constraint components as being equal and fails miserably because it is impossible to do so. Diagram A shows the triple constraint as a triangle, but it usually is not an equilateral triangle. Changing one of the three constraints almost always has an impact on the other two constraints.

A Common Scenario

Let's assume you did have a conversation with your sponsor at the beginning of the project and she prioritized the constraints as: time, resources, then scope. It's now two months later and the project schedule is slipping because critical path activities are taking longer to complete than anticipated. You have submitted a significant change request to add resources, a 10% overall increase, for example, to the project to ensure the project end date can be obtained. However, your sponsor rejects the change request, stating that the project cannot exceed the currently allocated project budget due to recent budget cuts.

At this point, you must discuss with your sponsor changing the *priority* of the triple constraint components. It's apparent that resources (money) are now the highest priority, and it is impossible to meet the end date with the current allocation of resources and scope. Because scope was the lowest prioritized constraint as agreed upon, you have already reduced it to the minimum acceptable level by the business, so your next logical option is to move out the project end date. If your sponsor says "that's impossible," then you should remind her that you must balance between the three constraints and something must give. It is essential for you to take a stand and remind your sponsor about the critical balance between the constraints and work with her to stabilize the project.

Educating Your Sponsor on the Triple Constraint

Conversations like this are difficult, but they are essential for the ultimate success of the project. Maybe the business areas can reduce scope some more. Is there any chance *some* of the budget for the project can be increased? Maybe you can get more internal resources and remove some of the project consultants that are more expensive. It's time to get creative — but it's not appropriate to compromise the concept behind the triple

1

Industry News and Notes . . .
updates from the project management field

CIO Council Details IT Project Management Requirements

Officials from the federal Chief Information Officers Council's IT Workforce and Human Capital Committee have approved a draft of standards for IT project management within the federal government. The three-tiered rating system identifies project management requirements needed for IT initiatives and outlines the amount of experience and training necessary to manage specific projects.

The three tiers address projects ranging from those with low to moderate complexity to those with a government-wide impact. Each tier outlines requirements for project managers working at that level. The report will provide universal standards that CIOs can use to assess their project managers.

For more information, please visit www.cio.gov.

September ProjectWorld Event Relocated

IIR Exhibitions, Inc. has announced that its September ProjectWorld event has been moved to the Washington, DC area and rescheduled for September 27–30, 2004. The original location of this event was the Baltimore Convention Center. The change in venue was attributed to the vital role that the location played at the recent ProjectWorld event in Los Angeles. Bailey Beeken, President of IIR Exhibitions, noted that interaction between presenters, attendees and sponsors increased in Los Angeles due to the site environment. The Hilton McLean Tysons Corner has been chosen for its intimate environment as well as its proximity to downtown DC and the area's airports.

In addition to the new venue, this year's ProjectWorld will feature new content in the growth areas of Enterprise Project Management (EPM) and Program Project Management (PPM). This event will also offer C-level executives an Executive Forum and an IT Investment Planning workshop.

For more information, visit www.projectworld.com.

Pacific Edge Software Launches portfolioKNOWLEDGE.com

Pacific Edge Software recently launched portfolioKNOWLEDGE.com, a premiere source for Enterprise Portfolio Management Intelligence. The Web site provides detailed articles by industry experts, CIOs and analysts, as well as information on relevant Web sites, book reviews, events and trade and business news stories. The need for such a site arose out of the rapid growth of portfolio management implementation. This new site provides a central source of information for organizations implementing portfolio management.

Pacific Edge is a leading Enterprise Portfolio Management provider, offering software and services that enable organizations to consider business investment opportunities in terms of their contribution to overall corporate objectives.

To view the site, go to www.portfolioKNOWLEDGE.com or, to learn more about Pacific Edge Software, please visit www.pacificedge.com.

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constraint. If you don't push back, your sponsor will assume you can "pull it off." It is not in the best interest of the project team or the company to have people work even more overtime than they already are and/or reduce the quality of the agreed-upon scope, which is typically what happens.

The prioritization of the triple constraint can, and will, change throughout the life of the project. However, the prioritization should not change *frequently* and you definitely don't want it changing back and forth. When the priority does change or appears to be changing based on the behavior you're observing from your sponsor, it should be confirmed via an overt conversation with your sponsor.

This will enable you to move forward and continue making daily decisions about your project based on the new prioritization of the triple constraint.

As the project manager, it's your job to educate your sponsor and other key stakeholders regarding the triple constraint concept and to manage them effectively. Anyone can *understand* the triple constraint concept; however, *managing* the triple constraint successfully is the hard part. It's similar to a diet — the concept of a diet is easy: If you consume fewer calories than you burn, you will lose weight. Easy concept but extremely difficult to implement successfully!

A Framework for Metrics-Based Project Management: Things, People and Enterprise

By Dr. Ginger Levin and Dr. Parviz F. Rad, PMP

It has long been recognized that metrics can be collected and utilized throughout all phases and facets of project management. The focus of a metrics system, which in turn defines the structure of measurement activities, is guided by organizational strategic objectives. Generally, metrics emphasize process improvement, portfolio management, progress management and benchmarking. Those organizations that develop a performance-based system with a focus on portfolio management, and follow a management-by-projects approach, are the ones that continually become more sophisticated in the area of project management. Such a management philosophy is highly formalized and methodical, particularly if it relies heavily on project measurement practices that are objective and consistent.

The Purpose of Metrics in Project Management

Metrics can help guide the organization toward informed decisions by providing indicators regarding the quality, adequacy and progress of projects, processes and products. Metrics can enable the enterprise to recognize the sum of its collective capabilities, which can lead to consistently realistic and achievable plans for producing and delivering products and services. Additionally, metrics can promote teamwork and improve team morale by linking efforts of individual team members to the overall success of the project, and ultimately, the success of the organization.

Metrics can also identify important events and trends in the organization and can help guide the organization toward informed decisions. They can measure the status and effectiveness of activities, within the context of processes, in order to gauge the contribution of project management to the organization and they can serve as the basis for clear and objective communication with project stakeholders. Finally, some metrics have the potential to serve as barometers of organizational project management maturity.

Given that metrics in and of themselves do not impart any value to the organization, the return on investment of a metrics program is the value of the action a project professional takes, with the assistance of the metrics, to manage the issue at hand. Ultimately, metrics do not make decisions, people do; metrics simply provide the foundation and rationale for such decisions.

Multiple indices of project performance tend to produce synergistic results that can be used to make informed decisions about the direction of the project, the portfolio and, ultimately, the organization's strategic direction. Projects do not thrive, and often do not survive, in organizations that are indifferent, or possibly hostile, to projects. Conversely, projects will achieve the highest level of success if the organization is friendly toward, and supportive of projects. Project-friendly organizations will have metrics and procedures that define three sets of project-related issues: **things**, **people** and **enterprise**.

Things Metrics

Most project metrics focus on quantitative attributes that address performance in terms of efficiency, productivity and deliverables. Such quantitative facets of a project are the visible and tangible signs of the implementation and eventual success of the project. These metrics characterize tools that assess the progress and success of projects almost as if the projects run themselves, without any intervention by people. Things metrics describe the deliverable of the project and the efficiency with which it is being produced. The deliverable can be quantified and tracked with information relative to the work breakdown structure. The metrics for means and modes of the delivery include metrics dealing with elemental cost, project cost and project schedule. Finally, delivery issues include the level of sophistication in the management of risk, quality and contracts.

Scope and quality

Among the three components of the triple constraint, project scope and quality have been identified as the leading causes of errors and project changes. Often, the success of scope and quality issues tends to overshadow project performance in other areas. For example, it is almost certain that during the life of a project requirements will change for a variety of reasons. Differences between planned and developed requirements can be tracked by assessing the status of each deliverable as it moves through the project life cycle. Additionally, requirement volatility can be measured by maintaining a detailed history of the requirements changes and the rationale for each change. One of the realities of project work is that there often will be some defects in the deliverable and, as a result, corresponding rework will be required. Further, there is a risk that the resulting product will not perform appropriately as to its intended purpose. Therefore, those activities conducted to make changes in the deliverable in order to resolve any physical or performance defects must be tracked.

Cost and schedule

With respect to cost or schedule performance, the client's perception of success is similar to that for scope, since all three are normally based on the original values, the final values and the relative magnitude of any variance. Therefore, it is often useful to track the number of key milestones completed and missed by baselining the project schedule and tracking milestones to the specific WBS identification number for the work package or the control account. Differences in the scheduled delivery date and the actual delivery date can be tracked to determine why dates were missed. This information can be used for corrective action on current projects and preventative action on future, similar projects, and to help in the preparation of schedule templates for future, similar projects. Metrics can also be used to assess trade-off decisions throughout the project to determine, for example, whether or not a project's schedule should be compressed. Then, if schedule compression is needed, the impact of compression on resource requirements and the budget could also be looked at.

Using a cost estimating form, a metric can be established to record the project costs during the resource planning process. Then, the project's actual budget and records of expenditures can be tracked based on actual costs at the work package or control account level throughout the project. This can help in improving the quality of estimates on future projects by establishing a more realistic budget at the beginning of the project.

Earned value analysis and the corresponding metrics are also significant, including the relationship between the quantified indicators of expenditures of resources and the resulting quantified amount of deliverables at a particular point during the project. Based on the project's progress, one can use this information to make predictions as to the project's final cost and duration. Availability of such quantitative data early in a project — near the 15% completion point — can facilitate informed project decision-making.

Contractor performance

Contractor performance is another area of interest in the things category. It is measured with two somewhat separate indicators: one that deals with the contractor's behavior in terms of responsiveness to clients' request for minor scope changes within the confines of the original cost and delivery date, and the other that deals with performance of the project in terms of cost, schedule and quality. The cost of the contractor's activities in terms of managing the contract as compared to its plan, the actual delivery dates as compared to the plan and the amount of rework required are representative metrics in this area.

Risk

Risk metrics can be divided into metrics that categorize the nature of risk events, those that categorize the probability of occurrence of the risk events, and those that predict the impact of the events on the project outcome. These metrics can evaluate the effectiveness of risk response plans in terms of:

- The number of workarounds required
- Corrective actions that were implemented
- The team's ability to estimate the impact of identified risks and effectively mitigate them
- Use of contingency reserves
- Whether the chosen mitigation strategy actually lowered the probability of occurrence or the impact of the risk event.

People Metrics

As people issues of projects are brought to the forefront of project management, an increasing number of metrics should deal with people attributes, which have seemingly nondescript behavioral characteristics, such as loyalty, trust, collaboration, competency, communication, conflict and leadership. People metrics address the team members' relationships with one another and attempt to quantify or characterize the behavioral attributes of people. Since people make the project happen, project management is, or should be, primarily about people and how they work together in support of the project's objectives and, in turn, the organization's goals. However, it is difficult to quantify these metrics, which is why there are fewer project people metrics than things metrics.

Project people metrics are intended to assess, directly or indirectly, whether team members are executing their tasks well. These metrics measure the friendliness of the organization toward the project team and the team toward itself. Thus, they are indicators of the existence of procedures for conflict management, communication, collaboration, teamwork and technical competency. People metrics also deal with the features of the environment that promote leadership, integrity and professional responsibility.

The premise is that the more team members know about each other's attributes, the smoother the team will function. This mutual knowledge will also be the fuel for continuous improvement in relationships and, ultimately, in performance.

Enterprise-Oriented Metrics

Enterprise metrics address the environment in which the project team must operate. The attributes included in this category describe the organizational friendliness toward

projects, involvement of project teams in organizational strategies and recognition of the project management concept by the organization. The most effective metrics program is one in which the metrics are tailored to the organization's important issues and strategic objectives.

Enterprise metrics measure and/or infer the attributes of the enterprise as a whole and involve the structure and the environment for projects. It is important to note that the enterprise provides the environment for the project, while, at the same time, it is the direct beneficiary of the success of the project. Enterprise metrics also deal with business objectives and the all-important return on investment, which views the success of projects and the success of the organization from the pragmatic vantage point of the stockholders. These metrics quantify attributes of the environment within which projects must operate and include project portfolio models and indices that quantify organizational project management maturity, including the project management office.

At the first glance, all organizations measure the performance of projects using metrics that deal with the things aspects of projects, such as cost, schedule and scope. But, to what extent are the things issues supported, enhanced and elevated by the team's strengths in the areas of people issues and enterprise issues? When implementing a new metrics system, or simply compiling and formalizing an existing system, one needs to strike a balance between the organizational culture and the best practices of project management and establish metrics that cover all three areas.

This article is adopted from an upcoming book by Drs. Levin and Rad titled Assuring Project Success With Metrics-Based Management, to be published in 2004. They are also the authors of The Advanced Project Management Office and Achieving Project Management Success Using Virtual Teams. Contact Ginger Levin at ginlevin@aol.com and Parviz Rad at project.management@comcast.net.

Ensuring All Stakeholders Agree on Prioritization

Another common challenge surrounding the triple constraint is the different priorities that several key stakeholders typically have. Let's face it; our sponsor is not our only major stakeholder. We have key stakeholders, both internal and external, from each of the business entities that are impacted by the project and frequently the stakeholder representatives have different needs (scope) and different priorities. It's your job as the project manager to communicate to all stakeholders the predetermined priority of the triple constraint elements per the sponsor's desire. If this priority is in conflict with the desires of other stakeholders, you'll need to manage those expectations accordingly. Ultimately, the sponsor is typically the person paying for the project, and therefore, should dictate the priority of the triple constraint components.

Where Does Quality Fit In?

Another area of debate surrounding the triple constraint is quality. Where does quality reside relative to the triple constraint? PMI® recommends that you include quality on the scope side of the triple constraint diagram. This is based on the fact that quality activities, such as testing, using standards and templates, and quality reviews, are activities that must be performed in order to deliver the appropriate solution to the customer.

Therefore, if you get pressured by your sponsor and other major stakeholders to reduce testing in an attempt to meet a deadline and keep down costs, you should

reduce scope in order to decrease the amount of time necessary for testing. The fewer features (scope) there are, the quicker you will be able to complete testing. However, testing should not be arbitrarily reduced to meet a desired end date. This reduces the quality and stability of the end solution and could permanently tarnish the successful implementation of the end product. If you are forced to reduce testing time and are not allowed to reduce scope, you should request additional resources, via a change request form, to be leveraged during the post-implementation phase in order to deal with the additional problems anticipated once the solution is implemented. This approach can work for IT-related projects, but is not very effective for construction and engineering projects where a minimum level of quality is mandatory to adhere to safety standards.

Everything gets back to the triple constraint. You can leverage the triple constraint concept in almost every situation, including project management conflicts and challenges. We do have options, but our options are based on *leveraging* the triple constraint, not compromising it. Understanding the power behind the triple constraint concept will make you a more successful and respected project manager.

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