

How to Control a Project

*Practical “How To” Ways for Managing Today’s
Challenging Projects*



Michael D. Taylor

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HOW TO CONTROL A PROJECT

Having a project management plan will not always ensure having effective project control. Without a control process the project manager will often resort to an improper use of institutional authority to embarrass, or intimidate a project member whose performance is unsatisfactory. As a result the project member will learn to prevent disclosure of any problems. This then creates another problem in that the project manager is not being made fully aware of deviations from the project plan. Taylor's Law¹ states that "the earlier a problem is disclosed, the easier it is to manage." When project problems are hidden from the project manager they often grow to the point where they become untenable.

PROJECT CONTROL TECHNIQUES

Meredith and Mantel offer three methods of control.² These are:

- Cybernetic Control
- Go/No-Go Control
- Postcontrol

Cybernetic Control

Cybernetic³ control involves a self-correcting feedback loop as illustrated in Figure 1. Project control can be defined as the ability to identify deviations from a plan or a baseline, and take corrective action to get back on course. Therefore, in order to maintain cybernetic control of a project, four vital elements must be present.

¹ Michael D. Taylor, *Systems Management Services*, Copyright © 1998, All Rights Reserved.

² Jack R. Meredith and Samuel J. Mantel, Jr., *Project Management: A Managerial Approach*, Sixth Edition (Hoboken, NJ: John Wiley & Sons, 2003), pp. 546-557.

³ "Cybernetic" is based on a Greek word (*kybernetēs*) for a helmsman, or a steersman of a ship. The term was introduced by Norbert Wiener in 1948.

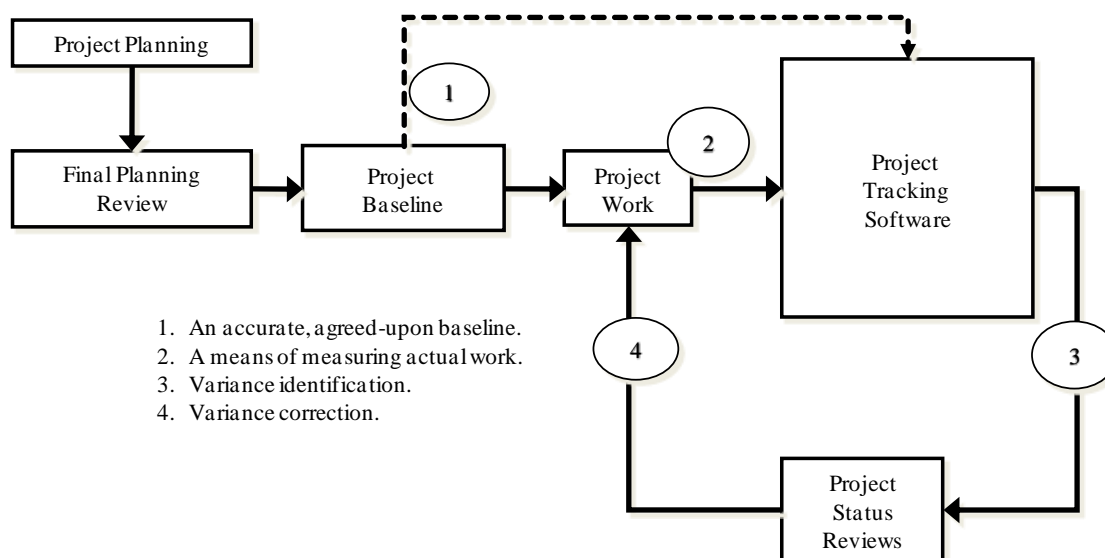


Figure 1 Cybernetic Control Process

First, an accurate, agreed-upon baseline must exist. The baseline consists of the project schedule, the project budget, and any other measurable aspect of the project. The initial baseline is established toward the end of the planning phase when the Final Planning Review is conducted. If all planning conflicts are resolved at the FPR, an accurate, agreed-upon baseline should be established. This effectively becomes like a compass against which a subsequent performance is measured.

Second, a means of measuring actual work is required. This can be a challenge due to subjective estimates as to how much of a given project activity has been completed. Assigning a percent completed to a given project activity is often a guess on the part of the individual who is responsible for that activity. In some cases, the individual may give an overly optimistic estimate of how much of the activity has been completed in order to avoid embarrassment during project status meetings. This phenomenon is often prevalent when the project manager uses “negative means” of controlling variances from the project baseline. To avoid this dilemma, techniques such as the Earned-Value Management weighted milestones method can be adopted.

Third, the control system must be capable of identifying variances from the baseline. Most project schedule applications will provide variance reports provided it has the baseline and actual work information. The software will determine the differences between these two factors and will provide variance information to the project manager. It is these variances that are typically reviewed during the regular project status reviews. The control chart below illustrates how variances can be identified using the Earned-Value Management (EVM) method.

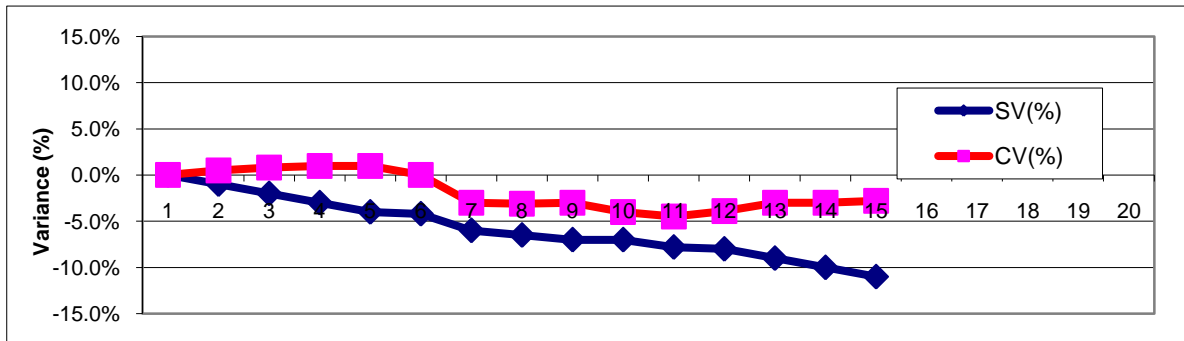


Figure 2 Project Tracking Control Chart Example

Fourth, corrective actions must be taken for those variances that are deemed unacceptable. Variances in excess of 10% should be considered significant, and the project manager should require the “owners” of the unacceptable variances to develop and present the steps needed to get back to the baseline plan as quickly as possible. Either “soft” or “hard” recovering planning must be conducted. This will be described later in this chapter.

Go/No-Go Control

Another technique for maintaining project control is the go/no-go method. Go/no-go controls take the form of testing to see if some specific precondition has been met.⁴ This technique can be used when facing a risk condition where a risk response has been prepared. If the risk condition is not present the control decision will be to “go,” or continue as planned without implementing the risk response. On the other hand, if the risk condition is present then a “no-go” control decision must be made. This simply means that the original plan is replaced with the risk response plan.

Post Control

Post control methods are used after the fact. For example, a project member may announce a significant variance from the project baseline. The expected response from the project manager is to require that individual to prepare a corrective action plan. If an acceptable corrective action plan is established the project manager may assume that the problem has been adequately addressed, yet this is not the case.

⁴ Meredith and Mantel, p. 569.

In addition to the corrective plan, the project manager must also ask the question, “What caused the problem?” This later effort is a form of post control. Solving the underlying cause of the problem is post control. If post control techniques are not used, the project manager can expect the underlying cause to manifest itself in other ways, and as time continues, more and more effects of the underlying cause will arise.

Post control is also appropriate at the close of a project where a lessons-learned review is conducted. The project manager is expected to identify any and all project process weaknesses including such areas as project control, project tracking, stakeholder communications, problem solving, and decision making. After underlying causes are identified, plans to avoid them in the future should be developed. This is post control.

HOW TO RECOVER FROM UNACCEPTABLE VARIANCES

When an unacceptable variance from the project management plan arises the project manager needs to ensure that a corrective action plan is established. Even though the primary responsibility for the plan falls on the individual who “owns” the variance, the project manager needs to provide support as a solution facilitator.

Avoiding cost growth and schedule completion delays is paramount which means that any resources needed for correction are within the approved scope of the project. Every effort should be made to first develop “soft” recovery plans that do not require additional costs to the project. If that is not possible, then “hard” recovery plans, that do require additional costs or extensions to the project completion date, should be considered. Obviously, prevention of large variances is superior to experiencing these kinds of project impacts.

Soft Recovery Planning

Project managers should first explore corrective action plans that require no additional costs to the project. These may include exploiting lead-lag times, fast-tracking, working non-paid overtime hours, improving cumbersome procedures, reorganizing the organization breakdown structure, moving non-critical resources to the critical path, and reducing project scope. If none of these is possible the only alternative then is to develop hard recovery plans.

Hard Recovery Planning

Hard recovery planning means that any unacceptable variance corrective actions will require more budget or time than what has been allocated to the project. This will require approval by the project sponsor and possibly other key stakeholders before the plans can be implemented. In order to accomplish this the project manager may look into adding more resources, moving non-critical resources to the critical path activities even if it requires more budget, outsourcing certain portions of the project, and premium procurement of commercial off-the-shelf parts.

HOW TO CONTROL CHANGES TO THE PROJECT

Changes to the project management plan are inevitable. Rarely does a project manager finish a project with the same project management plan established at the Final Planning Review. If a project manager does not have a formal process for reviewing, evaluating, and approving any such changes the resulting impact will be uncontrolled scope creep.

Why Control Changes?

Uncontrolled changes will create confusion, and confusion will erode commitment to the project. Product quality, overall morale and general loss of interest will most likely take place when a project manager cannot control changes to the project management plan. The project manager's upward spiral in career advancement may also be dampened when key stakeholders see ineptness in managing project changes. If changes are not managed properly the project manager will experience unacceptable schedule slips, significant cost overruns, and reduced product quality.

Typical Change Sources

Typical project change sources may be generated by any of the following:

- Late clarification of requirements
- Continual product feature enhancements
- Corrections to poor planning
- Things the customer forgot when planning
- Changes in corporate strategies
- Corrections to product design deficiencies
- Arrival of new technologies

Configuration Management

The process for reviewing all change requests, approving changes and managing changes to the deliverables, organizational process assets, project documents and the project management plan is called “Perform Integrated Change Control.”⁵ This is also sometimes called *Configuration Management*.

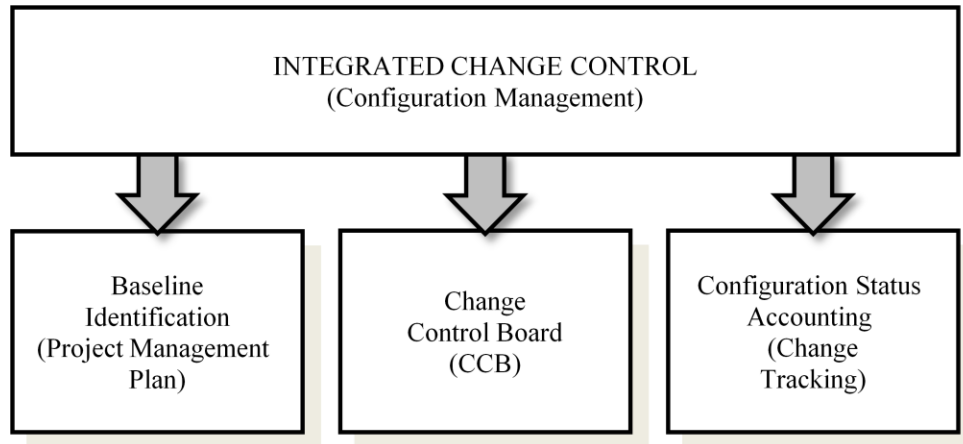


Figure 3 Integrated Change Control

Integrated change control is usually comprised of three main elements. First is the project baseline which is based on the project management plan. This is the project manager’s reference point, much like a compass providing direction. Next is the change control board which reviews, evaluates, and either approves or rejects proposed changes. Finally, the configuration status accounting aspect, also called “change tracking,” processes any approved changes. If a change to any portion of the project management plan is approved it is critical that all project members be made aware of it. Since this can entail a significant amount of work some project managers will appoint a configuration management specialist to process and track all approved changes

Change Control Board Members

Even though there may be those who regularly participate on the change control board project managers should feel free to include others as needed. After all aspects of a proposed change are discussed and evaluated the project manager ultimately makes the final decision. In some projects the CCB is external to the project. Prudent project managers will include either the customer or a marketing representative on the CCB so that the customer’s view of the potential change is taken into account.

Typical CCB participants may include the following:

⁵ PMBOK Paragraph 4.5

- Project manager
- Change originator
- Systems experts (systems engineers, chief architects, chief chemists, etc.)
- Those who will impacted by the change
- Configuration manager
- Others as needed

Change Assessment

When a proposed change is presented to the CCB the project manager will be faced with a series of important questions needed to assess it. These may include the following:

- What are the benefits of the change?
- Does it satisfy a customer/user's need in a better way?
- Will it impact any other activities?
- How will it affect the project's cost?
- Will it require additional project funding?
- How will it affect the project's schedule?
- Will it require an extension to the project completion date?
- How will it affect the product's quality?
- Can it be deferred to the next product version?

Configuration Status Accounting

Once a proposed change has been reviewed by the CCB, and the project manager has decided to accept the change, it must be disseminated to all project members. For example, if a change to the project schedule has been approved the revised schedule must be announced and provided to everyone on the project. Nothing is more confusing on a project than when multiple versions of a given documents are inadvertently being followed. Configuration status accounting, or change tracking can be very time consuming so some project managers will assign this task to a configuration manager, or to the project coordinator.

This individual will record and document all approved changes to provide what is sometimes called an audit trail. This may be needed if a question arises in the future about project changes. The configuration manager will also post the change on the project's Intranet so that it is available to all, and make certain that everyone on the project becomes aware of the approved change. If any contract fees are affected these are to be tracked as well.

Typical previously approved project documents that may fall under the jurisdiction under CCB may include the following:

- Customer/user requirements
- Design disclosure documentation

- Engineering drawings
- Specifications
- Software architecture
- Product interfaces
- User interfaces
- Source code
- Final test plan

Change Control Process

The change control process begins with a change proposal conceived by project members, project customers, or anyone external to the project. Some initial screening may be required to ensure that all necessary information about the change is complete and ready to be presented to the CCB. This eliminates many “false starts” in a CCB meeting.

Next, the CCB reviews the proposed change and the project manager either rejects or accepts it. If it is deemed favorable to the project manager the impact of the change to the project budget and the project schedule must be assessed. If the change can be absorbed within the existing project budget, and it will not affect the project completion date, it is sometimes categorized as a Class II change and does not require formal approval by the key stakeholders. However, if it will impact the project budget, or the project completion date, it is often categorized as a Class I change and requires approval by the key stakeholders.

If the key stakeholders approve the change then it implemented and the project management plan is updated. As stated previously, the approved change is then disseminated to all project participants. The figure below illustrates this change control process.

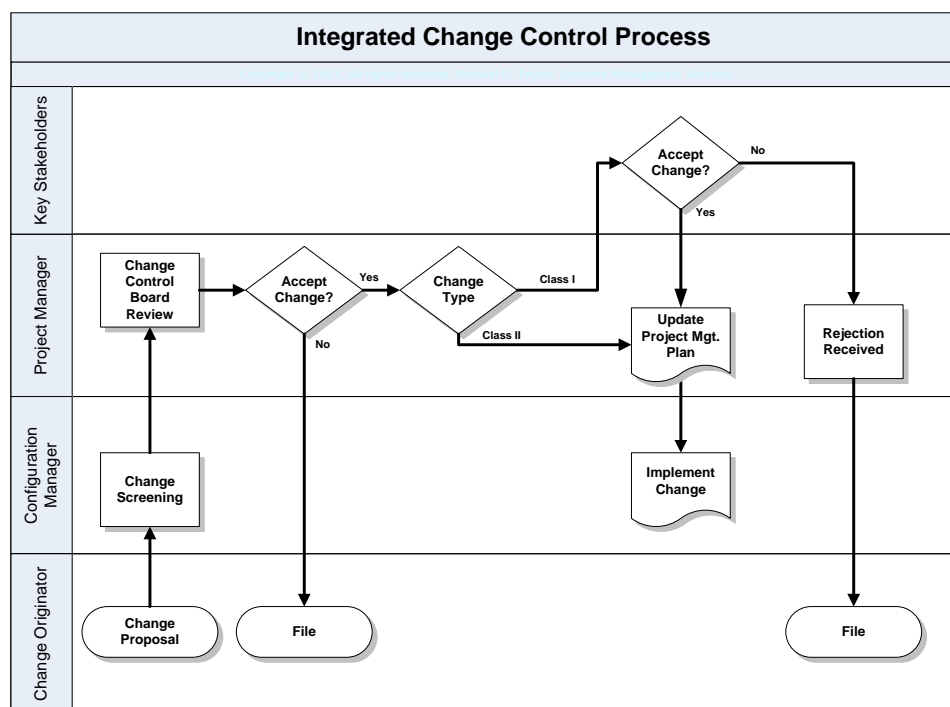


Figure 4 Integrated Change Control Flow Chart

THE ROLE OF THE PROJECT COORDINATOR

Most project managers find that they when they complete the planning of a project they become inundated in the following execution phase. This is primarily because of the need for overall project coordination, routine schedule management, integrated change control, and project status tracking. In most cases, there is more work than can be accomplished by the project manager, even when working overtime. For this reason, many corporations are realizing the need for a project coordinator, also called a project expediter.

Project Coordination

Project teams often require coordination of activities, resources, equipment, and information. To satisfy this need the project coordinator functions in their primary role. Any coordination issues which cannot be resolved are elevated to the project manager.

Project Schedule Management

It is the project coordinator who is to be the expert on the project schedule software. If project managers attempt to fulfill this role they will discover that it is so time consuming that it diverts their focus from the overall management of the project. In many cases they often find themselves having to “relearn” the intricacies of the software. To alleviate this dilemma, a project coordinator assumes the role of working with project team members to develop the initial project schedule, making certain that all project schedule conflicts are resolved, and then updating it routinely. When schedule compression techniques, such as lead-lag exploitation, fast-tracking, or critical path crashing become necessary, it is the project coordinator who works with project members to develop the trade-off data required by the project manager for making such decisions.

Project Status Reviews

While some project managers prefer to have each team leader present the status of the recent work, many insist on having the project coordinator present the status since they will be unbiased. As a result, true project problems will be surfaced in the project status review meetings. It will then be up to the project manager, and the “problem owner” to work out a corrective action plan. The project coordinator follows up on the approved corrective action plan.

Change Management

The task of presenting, reviewing, and tracking approved changes to the project management plan can also be very time consuming. Some larger companies adopt the practice of using a “configuration manager” to accomplish the necessary coordination of all proposed and finalized changes, however, many combine this role with that of a project coordinator. The coordinator would ensure that all necessary information has been gathered by the change initiator prior to presenting it to the change-control board, monitoring the review, and following up on all approved changes including the dissemination of any revised project documents.

Contract and Subcontract Administration

When projects involve either contract or subcontract administration, the project coordinator works to ensure project schedule integration with either the customer, or the subcontractor. Generally, the coordinator also tracks subcontractor schedules to identify problem areas.

The Dilemma

Since most corporations do not appreciate the need for supplying a project coordinator to the project as a support to the project manager, many project managers find themselves in the dilemma of becoming overwhelmed by the functions described above. George Heywood and Thomas Allen have recommended that about 2% to 5% of the total project budget be allocated to project coordination in order to prevent this dilemma.⁶



⁶ Heywood, George E., Thomas J. Allen, *Project Controls: How Much is Enough?* (PM Network, November, 1996).