

Project Management Concepts

By Bryan Chojnowski

Your team starts a project that has five key milestones. Things are going great as the team completes the first three milestones on time. Then, without much advanced notice, you completely miss the fourth and fifth milestones for the project. The overall timeline, budget, and end goal for the project are not met. Why did this happen? According to the Gartner Group, 'A full 66 percent of large scale projects fail to achieve their stated business objectives, are delivered late, or are substantially over budget.'¹ The reason is that many project are executed in a linear fashion when, in fact, non-linear, asymmetric execution is required in order to succeed.

The linear project management approach is most likely a byproduct of the 'Command and Control' business model that was put in place during the Industrial Revolution. One major tenet of this model is the assumption that you can treat human resources as interchangeable, with each producing a constant output over time. For example, a person working on a production line can make three widgets in an hour. Therefore, she will make 12 widgets in four hours and 24 widgets in eight hours. It is further assumed that another person can produce the widget just as effectively as the first, and two resources will produce 48 widgets in eight hours. The application of this linear logic in the business and project management domains is flawed. Yes, to some extent it is feasible to make general extrapolations to determine how much work can be completed over the duration of a project based on what can be completed in a unit of time, but the key error in this thinking is the attempt to also execute the project in a linear fashion without taking into account a project's complexity. I'll provide an example.

Let's say that in order to roll out a Quality System, twenty procedures must be created. It is estimated that, on average, one procedure can be completed every two days and, therefore, the project can be completed in 40 days. Starting on Day 1, one procedure is developed every two days. Things are going well until Day 30, when someone reviews the 15 completed procedures and finds that, while each is adequate independently, collectively, there are inconsistencies in common content and the documents are not properly integrated (e.g., the trigger for retraining does not take into account the document approval and release process). The documentation set is not cohesive and changes must be made. The updates are performed to the procedures to bring them into alignment but the target project completion date is missed and the budget is exceeded due to the required 'rework' activities. This project failed because the approach to execution was purely tactical as it was executed linearly and didn't adequately account for the documents' interdependencies. What is another way the project could have been executed?

The project manager could have spent several days extensively planning out the project, how the documents would fit together, identifying the elements of commonality, points of integration, and the potential hurdles to get over, creating relational diagrams for the documents, building out templates, etc. By developing this type of strategic overlay for the execution of the project, the tactical steps in the project can be performed more efficiently and effectively. Such a leveraged approach could allow for the completion of the procedures in one and one-half days on average, which would bring the tactical project execution time to 30 days total and therefore allow for up to ten days of strategic planning and management. The result is a better overall outcome—higher quality work outputs and on-time project completion.

Now that the concept of strategic project management has been introduced, this article will discuss the key elements of and underlying thinking behind a successful strategic project.

Own It

First and foremost, the project needs a true owner. One of the most common problems I see with failed projects is that there was no clear project owner. Not to be confused with the project champion (the person who wants to see the project completed), the project owner is the one person who is ultimately responsible for the success or failure of the project. Often there are multiple functional groups that contribute to a project and this can cloud the lines of ownership. Whether unintentional or by design, in my opinion, the lack of a clear project owner is the single biggest reason why projects fail. As described directly below, be sure to create an owner in each identified subproject, but top-level project ownership is the most critical.

Project Genus and Species

What type of project do you have? Projects vary from the simple to the ultra complex. In general, complexity is added as the volume of work increases, the variety of work increases, the disparity in the variety of work increases, oversight resources increase, and project resource (i.e., time, people, money) scarcity increases. The more complex a project is, the more dependencies it will have, and the more likely it is that unforeseen hurdles will be presented. The project timeline should take into account the loss of efficiencies, the additional project management time, as well as the increased likelihood of the unforeseen as complexity increases. My experience is that highly complex projects can require up to twice as many hours as an overall approximation where each project activity is separately estimated and then all estimates are summed. An assessment of the type of project will help determine the extent of planning required as well as the content of the project plan.

It's All in the Plan

A project plan should be utilized to set expectations by communicating the key project objectives, the primary activities in support of those objectives, the resources that will perform the activities, and the project timeline. It should focus on answering the question 'Is the timeline is feasible given the objectives to be met and the resources available?' In order to answer this question, be as detailed and granular as is necessary as this will help you to identify major challenges, which could significantly affect the project timeline, before project execution begins. The plan can also help you identify areas where efficiencies can be realized. Strategic thinking in this vane is especially important when a project timeline is tight. Due to time pressure, the tendency is to want to begin work as soon as possible but a little extra effort spent on planning can help you identify areas where resources can be used in a leveraged fashion. The plan should be sized appropriately for the project: A simple project should have a basic plan; A complex project should have a more detailed plan. After the project plan is approved, it should only need to be updated if a major shift in scope or resources available occurs. The associated timeline should require only minimal updates. If there are no major changes to the project, periodic checks against and updates to the project timeline should be sufficient.

Identify the Critical Constraints

Critical constraints² are those activities that will serve as a gating factor during the execution of the project. They have the potential to stall progress of adjacent activities as well as the completion of the project phases. Critical constraints occur in areas where there is heavy workload, where the timeline is long and can't be reduced simply by adding additional resources, (e.g., product aging studies will have to occur over a fixed period and there is no way to shorten the timeframe by deploying more resources) or where multiple resource groups are involved in the activity. Critical constraints merit significantly more attention during the course of the project so that they are addressed before they adversely affect the project outcome. As an example, let's say you are performing equipment operational qualifications on a microscope measuring system, a package sealer, and a refrigerator as part of a project. The first two items involve activities that can be performed in a few hours each. The refrigerator, however, requires

a temperature mapping to be performed over a period of 24 hours. Of the three activities, the refrigerator OQ is the critical constraint: It takes the longest and there is no opportunity to reduce the time required to complete the activity by applying additional resources.

Create a Strategic Overlay

If a project is executed as a series of independent tactical activities, it is lacking a strategic overlay. A strategic overlay, or framework, is created when the interrelationships of the project activities are well understood and accounted for in the execution of the project. A strategic overlay can be incorporated invisibly or it can be manifested in relational diagrams, process flowcharts, textual descriptions, etc. An overlay makes it clear where you are trying to get and how the pieces will fit together to achieve the objectives. The overlay practice lends to effective plan content but also should be applied within the main project areas during execution as well. A way to create a strategic overlay is to break up the project activities into discrete modules. The modules can then be organized to demonstrate sequential dependencies, which take into account the inputs and outputs of each module. The overlay identifies leveraging opportunities and organizes resources for efficient project execution. It is customized for each project and, similar to selecting the right tool from the toolbox for a particular task, comprises the specific project management elements, including those described herein, that are needed to complete the project per the established plan.

Use Resources Effectively

Successful project execution is about having the right people in the right roles at the right times. Like a good football team, each member knows his or her role and plays it effectively. You need linemen, tight ends, receivers, and running backs to support the project manager's quarterback role. You may even have slash players who can play different roles at different times. A well functioning team is apparent when each person plays his or her role and trusts others are playing their roles as well. Roles may be changed or swapped during the course of the project and you need to make the transitions cleanly so that you avoid having multiple team members unknowingly performing redundant work (i.e., two receivers in the same position running the same route on the same play). The project manager should perform project coordination, including ongoing communications with the project team members and project stakeholders to ensure resources have the best chance of completing their assigned work.

Couple Authority and Accountability

It starts at the top of the project team but applies to all team members. Resources need both authority and accountability in order to be effective. Ensure you do not put resources in a position where they have one without the other. Authority and accountability can be conveyed during the project in the form of work assignments. By setting expectations for what is to be completed by a given team member and then measuring performance against those expectations, you will achieve accountability. Authority is provided by giving resources an appropriate level of autonomy to complete their assigned tasks. In order to determine the appropriate level of autonomy for each team members you must make sound initial judgments and then monitor outputs closely.

Find the Levers

The natural progression in increasing work output is illustrated in Figure 1.



Figure 1: Work Output Progression

Most people are intimately familiar with the first four blocks. The fifth block, 'work in a leveraged fashion', is where the greatest benefits in work output can be realized. Projects are successful when you are able to find the levers that create work multipliers. If a project involves repeating the same activities multiple times, i.e., for different product lines, different equipment lines, etc., there is an excellent opportunity to work in a leveraged fashion. For example, rather than simultaneously deploying several resources to independently create work product for the different pieces of equipment, if you are able to perform the process for one piece of equipment (ideally the most complex), you can take the outputs and create guidelines and templates that can be followed for each of the other pieces of equipment. While you spend more time on the initial 'pilot', you can eliminate the need to address the same challenges for each of the different pieces of equipment and, in addition, create a much more consistent set of deliverables for the overall project.

Set Up the Guard Rails

Project guard rails serve intertwined purposes. First, they set the boundaries inside which resources can act autonomously. Second, they help to prevent adverse impacts on the project scope and timeline. Guard rails imply 'not to proceed without prior approval' and can be tacit or explicit. A tacit guard rail can be created by a well-defined work assignment. The work assignment for a given resource should match his or her level of authority so that he or she can make decisions autonomously to the benefit of the project. Guard rails can be constructed for project sub-team as well. I'll provide an example.

A software development project includes requirements definition, software development, system test, and operation/maintenance. To keep things simple, let's say subject matter experts are responsible for the requirements definition, developers are responsible for code creation, quality assurance is responsible for testing, and technical services is responsible for system deployment. A few examples of guard rails for the resource groups would be the following.

- Once approved, subject matter experts cannot change a requirement without prior consent from the project team.
- Developers must create code based on the approved requirements only.
- Testers will test the code based on the approved requirements only.
- Technical services will deploy only code that has been formally tested and approved.

These guard rails are typically explicitly stated in procedures that govern the area involved.

Guard rails applied to individual resources are often ad hoc and rely on the skills and expertise of the project manager. In general, tighter guard rails are required for inexperienced and/or unproven resources. Keep in mind that a proven resource in one domain could be unproven in another domain. An example is a technical person who is adept at troubleshooting but has not had much experience with creating technical documentation. If this person is responsible to producing technical documentation, ensure the guard rail is tighter initially.

Guard rails can and should change during the course of the project. They should take into account the risk of the area inside the rails. As a team member develops a pattern of success in a particular domain, expand his or her level of autonomy so that the benefits to the project can be maximized. The ideal is to have not only minimal guard railing for a project and to have the rails set as far out as possible. An effective project manager can set and adjust resource guard rails on the fly based on intuition and real-time feedback. A project manager less familiar with this approach may want to document the guard rails and associated process until it becomes second nature.

Guard rails are typically not discussed openly by a project manager as they are the unnoticed combination of the procedural and project management techniques employed.

Manage the Configuration

Configuration management is often associated with software development activities, but it is an activity that can make or break a project. Configuration management is especially important when various resources contribute to the completion of project deliverables. Simply, it is the actions performed to ensure that project deliverables are tracked and controlled in such a way that they can be easily located, identified, and revised. Commercial tools are available to assist with configuration management, but basic processes instituted by the project manager can also have the desired effect. For instance, during the project you want to avoid having multiple project resources updating the same document deliverable at the same time. As part of configuration management, you can phase the updates to the document so that no two resources are performing updates to it at the same time. You arrange to have 'resource A' update the document and then pass it to 'resource B'. If time constraints exist and you need to update the document more quickly, you could divide up the document into sections and ask the two resources to update only their designated sections of responsibility and track changes when doing so. Deciding on a file naming convention can also lend to effective configuration management. As an example, all project resources can agree to append a date and revision to the end of each file name, with the revision number corresponding to revisions on that particular date, e.g., 'Visual Measurement System Operational Qualification 5Jul2007 R1'. If the document is updated the following day, the file name will then become 'Visual Measurement System Operational Qualification 6Jul2007' and if it's modified yet again on the 6th of July, the file name will be 'Visual Measurement System Operational Qualification 6Jul2007 R1'. Focus your configuration management efforts based on risk. Microsoft Word's 'Compare and Merge Documents' functionality makes it fairly easy to identify changes made in a document. Microsoft Visio, however, has no such functionality so it would be more time consuming to recover from a configuration management problem. Therefore, you may want to exercise tighter controls on the Visio files than on the Microsoft Word files.

Decouple Urgency and Importance

One of the most common mistakes made during the execution of a project is to treat important activities as though they are automatically urgent.³ Urgency and importance should be independently evaluated, beginning with importance. An effective project plan will encompass all project activities in a way that allows a natural, logical flow of execution. When logically organized, important project activities will likely occur throughout the duration of the project as there are often sequential dependencies. Important activities require additional attention to ensure they are completed as planned, but project managers should avoid the tendency to allow important activities to dictate the sequence of execution of the project, especially when new important activities are identified during the execution of the project. Be sure you are assessing the importance of an activity independent of its delivery mechanism. For instance, if the head of a department requests that a particular activity be completed during the project, you must resist the urge to restructure the project in an illogical fashion so that the request of this senior individual can be satisfied as quickly as possible. What you should do is assess where the activity to satisfy the particular request naturally slots into the established project plan. If it is a new activity that isn't accounted for in the plan, determine its most logical placement objectively. You should then communicate clearly with the requesting party when the activity will be completed and why you've taken the selected approach.

Decisions, Decisions

Learn to quickly differentiate critical decisions from non-critical decisions. Critical decisions can have a significant impact on the scope, budget, gross resource allocation, or timeline of the project while non-critical decisions do not. Critical decisions will therefore typically have an effect on the dependencies of the project. Make non-critical decisions as quickly as possible but take the necessary time to determine the best course of action when a difficult, critical decision must be made. Get into the project execution details as much as possible as understanding them will help ensure success. The ideal is that the project subject matter becomes a discourse: you understand it so well that you can effortlessly recall important project details so that you can make sound decisions and course corrections. The implicit expectation within companies is often that a project manager be able to make quick, decisive decisions, but don't be afraid to delay a decision so that further research can be conducted or so that you simply have time to think through things clearly in a quiet environment.

If You Must, Adjust

A critical decision for the project may be that you need to make a course correction. As the project is being executed, it may become apparent that the project activity order must be changed because a critical constraint is revealed that must be slotted into the project as quickly as possible in order to allow the project to be completed on time. Ideally, the project timeline and activity phasing do not need to be adjusted during a project, but don't avoid updating the project timeline in the interest of achieving intermediate milestones if it means you'll eliminate your chances of completing the project successfully. If you must adjust milestones in order to accommodate new critical constraints and give the team a chance to complete the project on time, don't hesitate. Remember that the end goal is the successful completion of the project, not the achievement of intermediate milestones. When early explorers set sail for other lands, they sometimes came across unexpected landmasses along the paths they'd charted. Rather than staying the course and running their boats onto land, they adjusted and stayed afloat.

Escalate Effectively

It is important to quickly recognize when it is appropriate to escalate issues during a project's execution, but equally important to know when not to escalate. Escalation can take multiple forms: the type of communication; the level of the resource with whom you communicate, formally updating the key metrics of the project such as timeline, budget, resources required, etc. Escalation is all about getting the right resources involved at the right times through the right communication channels. As an example, if you send an email to an individual and it is clear in his response that he did not understand your request, visit him in person or call him on the phone. If a particular project task to be completed is critical, communicate directly with the resource who is assigned the task in person to ensure expectations are clear. If a problem involving one person occurs but it could be repeated by other team members, call a team meeting to discuss the problem and how it will be avoided in the future. The below Figure 2 is one example of an escalation diagram. Based on the circumstance, escalation can occur in one block before proceeding to the next. In some cases, you will need to skip over intra-block escalations and potentially over blocks in order to achieve the correct audience and communication medium.

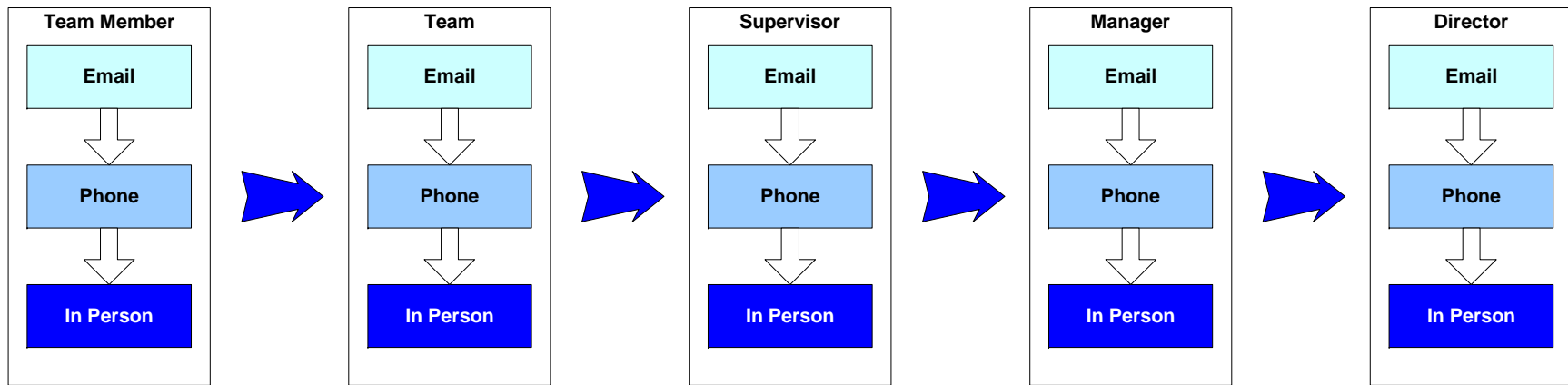


Figure 2: Basic Communication Escalation Diagram

Keep it Smooth

A good project manager can be compared to an iceberg: While his or her presence is apparent to those involved in the project, there is a lot of work performed by the PM that goes unnoticed. Project managers should work to keep the project disruptions, real or perceived, to a minimum. Momentum will be lost if the project team is frequently subjected to major shifts in the scope or timeline or method of execution of the project. Every project will have adjustments that need to be made, but not all adjustments need to send a ripple through the project team. While effective planning will minimize unforeseen obstacles, there will still be hurdles to get over and an important role of the project manager is to act as a team scout. As a scout, you'll get out ahead of the work being performed to identify potential hurdles and minimize them to ensure the future project activities can be executed as effectively as possible. As a project manager you must develop a way of tracking the project that allows you to understand the important elements of the project and whether or not the project is on schedule but not be so complex or detailed that it requires tedious, ongoing updates in order to be current. This approach serves two purposes: One, it minimizes the time spent updating the project plan/timeline and two, it reduces the perception of the project team members that the project strategy is in an ongoing state of flux.

Ambiguity is Okay

Complex projects will naturally introduce areas of ambiguity. When ambiguity occurs, identify the area where it exists and check the project plan to understand if it will be resolved during the natural execution of the project. Ambiguity is uncomfortable, but the urge to address each unknown situation as it arises will wreak havoc on the success of a project. The key is to understand if the ambiguity will be addressed at some time during the course of the project and then rely on this planned activity to resolve it. As an illustration of this concept, if you've ever rock climbed, you've probably had to deal with ambiguity in the proper fashion. Before your climb, as you look up the face of the rock, you'll identify sections that will likely be difficult to navigate. You know they exist and can think through some possible solutions from the ground, like a potential alternate route, but some challenges are unavoidable and you won't be able to ascertain the best actual solution to them until you're on the face and can see the difficult section firsthand. When you've exhausted your planning options from the ground, you'll need to rely on your abilities to problem solve and act effectively when you are in close range of the obstacle and can better assess your options from the improved vantage point. As a project manager, you should recognize situations analogous to the rock climbing conundrum, show restraint, and address them in a similar fashion.

It's All About Style

One thing is for certain, every project manager has a different style. Rather than prescribe specific tools for project management, I've discussed general topics in the hope that each manager can adapt the ideas into the project management framework and toolset that works best for him or her. If you incorporate the concepts presented in this article into a future project, it will likely feel 'different' to you and the individuals involved in the project. Don't be discouraged, stay the course, and focus on the end goal. If used appropriately, these tools will help your project team achieve success. Lastly, these strategic concepts have broad applicability. Think about how they apply to projects in different industries as well as to running a successful business.

References:

1. Gartner Group: Critical Program Management
(http://www.gartner.com/it/products/consulting/critical_program_mgmt.jsp)
2. Cox, J., Goldratt, E.M., The Goal: A Process of Ongoing Improvement, Massachusetts, North River Press, 1992.
3. Covey, S.R., Seven Habits of Highly Effective People, New York, Fireside, 1990.