Knowledge: The Core Problem of Project Failure

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After having participated in more than 10 independent reviews of major acquisition projects, and having been associated with project/program management throughout my military career, I assert that the cause of project failures is knowledge: either managers do not have the necessary knowledge, or they do not properly apply the knowledge they have.

Having led and participated in more than 10 Independent Expert Program Reviews[1] (IEPRs) for the Software Technology Support Center and the Tri-Service Assessment Office, and having spent my military career as a project/program manager, several individuals have asked if there is a common thread among programs or projects that are having difficulty. The answer is yes. Some expect the thread to be project planning, others risk management, and others expect one of the other project management themes. However, the root causes can be reduced to two issues: either project managers do not have the knowledge they need, or they do not properly apply the knowledge they have. Throughout the remainder of this article, I will refer only to projects, but will mean both programs and projects.

Some may consider these two issues to be too simplistic. However, if they take their pet principle from the Capability Maturity Model Integration (CMMI®)[2], the Project Management Institute's Project Management Body of Knowledge (PMBOK)[3], the Tri-Service Assessment[4], Typology, etc., and then ask why a project is having difficulty in that particular area, it still boils down to either a project manager lacks knowledge of the particular principle, or that the knowledge has not been applied properly. The Project Failure Cause-Effect Diagram (Figure 1 and sidebar) shows this relationship, admittedly through a great leap of logic between all the causes leading to project failure (155).

Lack of Knowledge

The first of these primary causes of project failure – project managers do not know what to do (115) – is the easiest to correct. One solution is to provide the necessary training, remedying the problem of managers not receiving necessary training (100). Jack Ferguson, while teaching workshops for the Software Engineering Institute, used to use the phrase "Just too late training." What he meant was that too often, training in a particular topic is provided too far in advance of need. Students often have been heard saying, "Why do I need to learn this stuff? I'll never use it." When training is provided *just too late*, the students have already realized the need for the training and can readily see how the principles being taught can help them be more successful in accomplishing their projects. This does not mean that the project is in trouble prior to receiving training, but that training is provided at the appropriate time in the project life cycle. For example, providing in-depth training on project closeout prior to project initiation has less value than providing such training as the project enters the project closeout phase of the life cycle, and project members now realize the importance of having the training.

This, however, implies that the project has a plan for training. Many organizations that have undergone IEPRs had neither individual training plans nor an allocated budget to provide necessary training, implying that senior management had either not been trained in the need for establishing an organization training program or had not applied what they had been taught.

The project manager's lack of

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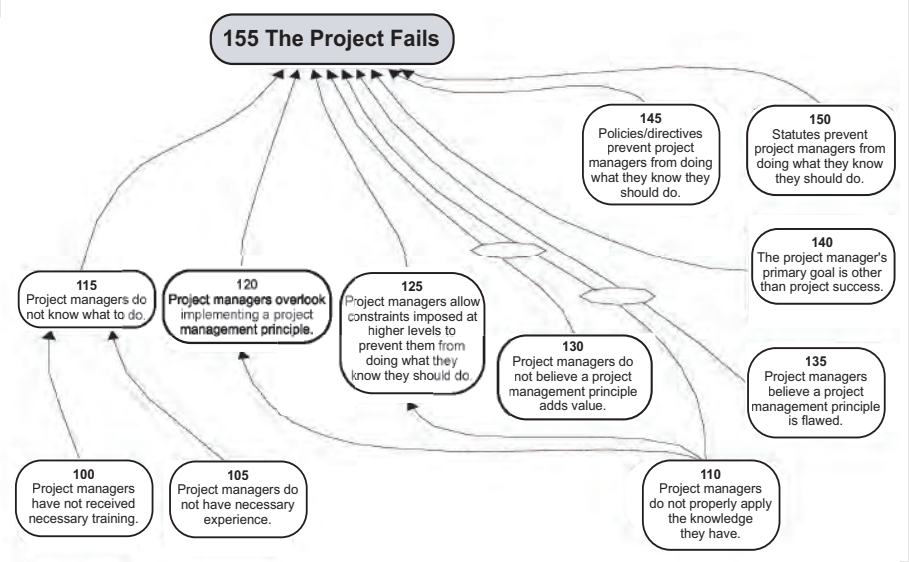
The Project Failure Cause-Effect Diagram

The Cause-Effect Diagram is read by locating the entity at the tail of an arrow, and reading it preceded by the word *If*. Then read the entity at the head of the arrow, preceded by the word *then*. For example, the arrow between entities 100 and 115 of the figure would be read: *If* 100 Project managers have not received necessary training, *then* 115 Project managers do not know what to do. If there are several causes joined by an ellipse, read the *If* only once, with other contributing cause statements joined by *and*. For example, the arrows between entities 110 and 155 and 130 and 155 read: *If* 110 Project managers do not properly apply the knowledge they have *and* 130 Project managers do not believe a project management principle adds value *then* 155 The project fails.

Figure 1: *The Project Failure Cause-Effect Diagram*



experience (105) is often regarded as a *what came first, the chicken or the egg?* problem. An individual needs experience to be a good manager, but how can one gain experience unless they are given the opportunity to manage? The answer is to allow managers to develop experience by learning to manage small projects before being given responsibility for large projects. However, this is not always the case. Some project managers have been put in charge of acquisition category one (ACAT 1) projects after having received only the 14-week Defense Systems Management College program management course, having no prior experience in system acquisition.

Improper Application of Knowledge

Project managers not properly applying the knowledge they have (110) – the second root cause of project failure – is more difficult to remedy. There are five associated causes and effects for this cause shown in Figure 1. If the issue is one of overlooking the implementation of a project management principle (120), i.e., just a lapse of memory in what needed to be done, then gentle reminders from subordinates, peers, or supervisors can be a catalyst to correct the omission. Program offices can provide mentoring to project managers to deal with such oversight. This mentoring can be used to provide refresher training to those who either have forgotten what to do or may not be familiar with current policy, directives, procedures, etc.

Stories abound of projects tasked to accomplish the impossible based on imposed constraints (e.g., cost, resources, performance, etc.) (125). For example, the project manager may determine that a project will take 36 months to complete, but downward direction is to provide *rubber on the ramp* in 30 months. The only way to accomplish this is to take shortcuts, eliminating such things as peer reviews, close configuration management, risk management, etc. Unfortunately, taking shortcuts usually results in lengthening a project because of rework. What would have taken 36 months in a well-planned project now takes 48 months. The only real cure that I know of for this issue is personal integrity: the willingness to tell higher management that their tasking is impossible, and then helping senior management realize that based on current technology, policy, directives, procedures, budget availability, etc., that a project cannot be completed as directed. Note that having a repository of measurements from previous projects or using available industry data can help sway senior management in setting reasonable expectations.

Some project managers consider some mandated project management practices to be of little value (130). For example, some consider preparing a formal project plan to be a waste of effort. They consider a project schedule prepared by using one of the popular project management software packages to be adequate[5]. Others may consider peer reviews of code or documents to use more resources than the value gained. Rather than discuss their concerns with senior management, they choose to ignore the principle with which they disagree. When the belief that a practice does not add value is coupled with the decision to not implement it, project failure can occur. Project managers should discuss their concerns with senior managers and resolve them. One of the best ways to deal with these concerns is to use historical data from other projects to validate the benefit of certain practices or to show the consequences of not following certain practices.

> *"Within the past few years, changes in the Federal Acquisition Regulation and the Department of Defense 5000 series have given managers greater latitude in managing their projects, but the pendulum can always swing back to impose more constraints, whether they are warranted or not."*

Books espousing various project management philosophies and methodologies abound. Current policies and directives have mandated some of the philosophies and methodologies while ignoring others. Some project managers may not believe that the mandated philosophies are the best approaches to use (135). Rather than implement what they consider to be flawed methods, they choose to follow what they consider to be proper principles. During management reviews, it becomes evident that the mandated methods are not being used, and the project manager is directed to implement the mandated method. Resources are now consumed in either getting on the *right* track or in trying to gain approval to not use the mandated methodology – resources that are usually scarce. This use of scarce resources has a negative impact on the chance of project completion within the originally allocated cost and schedule. One solution to this problem is to gain agreement during the project initiation phase of the project life cycle among all parties regarding the project management principles to be used for the remainder of the project.

But what if the application of sound project management principles to ensure project success is not the primary goal of the project manager (140)? While this problem seldom occurs, a few project managers may see their current position as a stepping stone for advancement to higher positions. Their goal may be to show good short-term results at the expense of overall project success. They build a *house of cards* hoping it will stay together and that the collapse will not occur until after the project manager is reassigned. This also is a personal integrity issue. The development of personal integrity in project managers is well beyond the scope of this article.

Though the issues of policy/directives (145) or statutes (laws) (150) preventing a project manager from properly managing a project seldom occur, they both must be recognized as potential causes of project failure. Within the past few years, changes in the Federal Acquisition Regulation and the Department of Defense (DoD) 5000 series have given managers greater latitude in managing their projects, but the pendulum can always swing back to impose more constraints, whether they are warranted or not.

A Word of Caution

If projects continue to have difficulty even after applying what are considered to be sound project management principles, maybe it is the principle that is in error. One definition of idiocy is to continue do things the same way and to expect different results. However, doing

things the same way is an underlying premise of process improvement, i.e., the process must be consistent (in statistical control) before it can be improved. If project performance is not as desired, even after consistent application of the project management principle, the underlying principle should be analyzed to determine the reason for the continual shortfall. Perhaps the principle is not as sound as some would have you believe.

Conclusion

Think about known project failures then do a root cause analysis in your mind. For example, why wasn't a project properly planned? Why was risk management not properly implemented? Why was the project not properly tracked? Why were any of the other project management principles not properly followed? I believe that if you evaluate the potential causes, you will reach the same conclusion that I have: it all boils down to knowledge. Either individuals do not have the necessary knowledge, or they have not properly applied the knowledge.◆

Notes

1. IEPRs were called for in Interim Regulation, DoD 5000.2-R, January 1, 2001, paragraph 2.6.8 for ACAT I-III Software Intensive Programs using the words, "The acquisition strategy shall describe the planned use of independent expert reviews for all ACAT I through ACAT III software-intensive programs." The Defense Acquisition Guidebook, Vers. 1.0, (10/17/2004), paragraph 11.14 still encourages the reviews, but the wording has been changed to read, "The program manager for an Acquisition Category ID or IC program that requires software development to achieve the needed capability should convene an independent expert program review after Milestone B and prior to the system Critical Design Review. The program manager, or other acquisition official in the program chain of command up to the component acquisition executive, should also consider independent expert program reviews for Acquisition Category IA, II, and III programs. The independent expert review team should report review findings directly to the program manager." This guidebook is available at <http://akss.dau.mil/dag/>.
2. The CMMI is available for free download at <http://www.sei.cmu.edu/cmmi/models/>.
3. The PMBOK guide is available for purchase at <http://www.pmibookstore.org/PMIBookStore/productDetails.aspx?itemID=358&varID=1>.
4. The Tri-Service Assessment Office is part of the Office of the Under Secretary of Defense (Acquisition, Technology, and Logistics). The Web site is <http://www.acq.osd.mil/tai/>, but is currently under construction.
5. Data Item Description (DID) DI-IPSC-81427A, Software Development Plan, provides a good template of the areas that should be included in a software project plan. The Institute of Electrical and Electronics Engineers Standard 1058-1998, Standard for Software Project Management Plans, is another source for an example project plan. As described in the PMBOK guide and the cited DID, a project plan is more than a schedule.

About the Author

Timothy K. Perkins currently is an independent consultant and has supported the Software Technology Support Center at Hill Air Force Base, Utah in providing consulting services to the U.S. Air Force, U.S. Department of Defense, and other government agencies. Perkins has led and participated in several Independent Expert Program Reviews of Acquisition Category I acquisition programs as well as three Capability Maturity Model® Integration Acquisition Module pilot assessments. He has been involved in software process improvement for the past 17 years. Before retiring from the Air Force, Perkins was Acquisition Professional Development Program Level 3-certified in Project Management and Systems Planning, Research, Development and Engineering, and Level 1 in Test and Evaluation. Perkins is a Project Management Institute-certified Project Management Professional and an authorized Theory of Constraints Thinking Process instructor. Perkins has a Bachelor of Science in Electrical Engineering from Brigham Young University and a Master of Business Administration from the University of Phoenix

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