

PROJECT MANAGEMENT IN CRISIS

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ABSTRACT: There is a growing crisis in the field of project management. More companies today define themselves as “projectized” – that is, their business model is one of executing a series of never ending projects. There are more people today who have the title Project Manager than at any time in history. Project management is now considered, by some, as a profession unto itself. Many professionals no longer refer to themselves in terms of educational background or training – as civil or mechanical engineers, software developers, computer engineers, etc. Rather, many now define themselves as Project Managers. As more project management certifications become available and are popularized by individuals and rewarded by employers, this trend is bound to continue for the foreseeable future. But, do these certifications make an individual a successful Project Manager? This paper will offer observations on what it takes to become an effective project manager. It is the author’s belief that a solid foundation in the area of project controls (cost engineering, estimating, scheduling, budgeting, cost tracking and trending, etc.) is a prerequisite to becoming a successful Project Manager. While many consider project controls a career in and of itself, it is the author’s contention that Project Managers are far less likely to succeed without a thorough grounding in project controls.

Introduction

For more than thirty years I have been involved in various aspects of project management planning and scheduling, risk analyses, cost analysis and contract management. My perspective has been in the area of claims and disputes on troubled projects. As a result, I have had the opportunity to observe and analyze literally hundreds of projects. Although I have always been associated with the engineering and construction industry, I believe that the observations set forth below probably extend well beyond this one industry.

Going back to the late 1970’s and early 1980’s the notion of “projectization” began gaining in popularity. Today, two plus decades later, many businesses describe themselves as being “projectized”. That is, their business model consists of performing a never-ending series of projects. While this business model makes sense in many industries – software development, aerospace, engineering and construction, to name but a few – the “projectized” business model has had a spinoff effect that was not initially foreseen.

One natural outgrowth of this business model redefinition is that many more people today carry or seek to earn the title Project Manager than at any time in history. Thus, more professionals today identify themselves as project managers. Fewer professionals identify with their educational background or training. When asked what their career field is, they will tell you that they are a project manager – rather than an electrical or mechanical engineer, a software developer, a computer hardware designer, etc. In order to gain recognition as a project manager, many are seek certification in project management, rather than experience. The natural consequence of this chain of events is that we have more certified project managers today than at any time previously.

Project Management – Science or Art?

A number of professional organizations focusing on project management have developed over the past two or three decades. In order to gain organizational credibility and add value for their membership many professional societies offer training and certification in project management. In order to attract more members to these organization and their certification processes, most have equated project management to a science. Why is this? Well, if one remembers the Dictionary definition of the term “science”, it is something that may be studied or learned as systematized knowledge. Science is generally considered to be knowledge covering general truths or the operation of general laws obtained and tested through the scientific method. It is systematized knowledge based upon scientific principles.

Why is project management so often equated to a science by these professional societies? Well, in my opinion, if project management is based upon a set of scientific principles or rules, then it can easily be mastered. Memorize the appropriate rules and apply these rules at the proper time for the “right” solution and the desirable result. The spinoff impact of this approach is the subliminal message that becoming a successful project manager is a relatively easy task. In fact, many vendors openly advertise “fast ways to quickly improve career options” by becoming a project manager.

One professional magazine recently reviewed contained the following statements –

“[This certification] is your ticket to success as a project manager. ... We use proven accelerated learning techniques to condense 180 hours of exam prep time into a five day program...”

“Instead of telling you what to learn, we help you learn and memorize the essential material in class. When you finish the ... three day ... course, you’ll be ready to pass the ... exam. [This class] prepares you to pass the ... exam after only three days.”

What impression is left with people attempting to become project managers? I suggest that the unintended message is that becoming a successful project manager is easy – take a class, memorize some immutable rules, pass a certification exam and you’re on your way to success as a project manager. I refer to this type of project manager as “theoretical project managers”. That is, they know and can articulate all the theories of project management, but have little experience in the practical application of these theories on a live project.

This impression is buttressed by the explosive growth of project management software over the past decade or so. Reviewing project management journals and magazines, the message is clear. Once a project manager is certified, all he or she need do is select the appropriate project management software, input the data, and out pops the “right” answer. Isn’t that the message the software industry is sending out? Let’s look at some recent statements about project management software and how it will solve all problems.

“Improve project productivity and quality”

“Ensure optimal resource management, cost control and schedule management”

“Analyze project status, automate processes and ensure compliance in real time”

“Use simple, out-of-the-box integration ... to identify project health problems”

So what is the result of all these factors? Well, I suggest the result is many industries have ended up with better educated, more credentialed, but less experienced project managers. That is, all too many project managers today are credentialed or certified, but lack real hands on project management experience. They come to their projects with briefcases full of computer software but lack experience with analyzing the output and formulating a practical plan for remedying project problems and challenges. In fact, some don't even know how to interpret the output of traditional project management reporting.

From the perspective of one who deals primarily with troubled projects, it seems to me that the increase in credentialed project managers and the ready availability of project management software has **not** resulted in a corresponding decrease in failed or troubled projects. In fact, almost the opposite appears to be true. There seems to be more projects in trouble today than in previous times, despite the increase in certified project managers. How can this be? Well let me offer some thoughts on this trend.

I suggest that project management is **not** a science governed by predictable and immutable rules. Rather, I take the position that project management is an art form. So what is art? Well, let's refer to the Dictionary definition of the term “art”. Art is a skill acquired by experience, study or observation. It is the conscious use of acquired skills and creative imagination. So what is the difference between science and art? Science is governed by unchangeable rules. This is why we can give the same mathematical equation to ten people educated in the science of mathematics and arrive at the same answer each and every time. Art, on the other hand, is a learned skill derived from experience and, as such, is full of human judgement. Give the same artistic problem to ten people and it is entirely possible you'll get back ten different answers, all of which are more or less appropriate under the circumstances.

The difference between these two approaches to project management is simple. When one relies upon supposed scientific norms or computer software to foresee potential problems, but lacks hands on experience, there is a far greater likelihood that problems will go undetected until they are severe. And, when one relies upon scientific practices and software to create solutions, but lacks experience to judge the appropriateness of the proposed solutions, there is a good likelihood that the selected corrective action will prove unsuccessful. To accurately predict and resolve the myriad problems, which arise on projects, a project manager needs experience tempered by good judgement. Therefore, a successful project manager practices the art of project management and relies upon experience and reasoned judgement far more than fixed rules and out-of-the-box computer software.

Cost Engineering and Project Management

I believe that to be a truly successful project manager one has to be well grounded in the disciplines associated with cost engineering and project controls. Two of the four measures of a successful project – those being, budget, schedule, quality and safety – clearly fall within the

realm of cost engineering and project controls and a cost engineer can provide some valuable input in the other two areas also. As defined by AACEI and various other member societies of ICEC, cost engineering and project controls encompasses the areas of cost estimating, cost control, business planning and management science, profitability analysis and project management, planning and scheduling.

In my opinion, it is much more difficult to become a successful project manager until there is some mastery of these functions. Further, experience has shown me that all too many troubled projects are managed by credentialed project managers who have little or no hands on experience in cost engineering and project controls. As a result, problem trends are not detected early and projects are often deeply troubled before it becomes apparent to the project manager.

Let's examine how a cost engineering and project controls background contributes to successful project management. Using PMI's PMBOK® 2000 as a guideline to the skills and knowledge of a successful project manager, there are nine knowledge areas applicable to all projects. They are the management of project integration, scope, time, cost, quality, human resources, communications, risk and procurement. The Construction Extension to PMBOK® 2000, released in late 2003 added four additional knowledge areas for capital construction projects – safety, environmental, financial and claim management. Let's explore for a few minutes how a cost engineering, project controls background will enhance a project manager's probability of success in each of these key areas.

Integration Management – This is the fundamental process of coordinating all elements of the project, taking into account competing objectives and alternatives, in order to meet the requirements of all stakeholders. Amongst the things a project manager must take into account in project integration are historical information, organizational policies, constraints, assumptions, and contracts. I would argue that a cost engineer is more capable of assessing and utilizing historical information when preparing a project plan than a project manager who relies solely upon theory. Cost engineers are also more likely to judge the accuracy and impact of constraints and assumptions than theoretically based project management types. Finally, cost engineers following integration management practices are more likely to develop realistic and achievable project management plans. Included in project integration management is a change control system, a configuration management system, and a performance management process. Cost engineers with their emphasis on estimating, cost control, planning and scheduling are typically much better situated to fashion and implement a workable change control system.

Scope Management – Scope management, of course, is the process that ensures the project scope includes all work necessary to deliver a successful project and then controls scope growth throughout project delivery. The elements of this process where a cost engineer would be more likely to succeed than a theoretically based project manager include cost/benefit analysis, alternatives identification, work breakdown structure, scope verification and scope change control.

Time Management – Time management is the process of predicting and controlling the time of the project to ensure project delivery within the allowable time. Areas of time management where a cost engineer is more likely to excel than a theoretical project manager include decomposition, constructability analysis, activity listing, and WBS updates. A cost engineer is probably in a better position to recognize and plan for mandatory, discretionary and external

dependencies. Experienced cost engineers are probably more knowledgeable of various scheduling techniques (ADM, PDM, PERT, etc.). Given their cost engineering and project controls background, cost engineers are more likely to be successful at estimating activity durations, resource requirements, project calendars, activity leads and lags, mathematical analysis techniques, duration compression, resource leveling and establishment of a coding structure. During project execution, when the issue turns to control of schedules, trained cost engineers have more experience in the areas of performance measurement and reporting, schedule management and updating, and input of change requests. Further, staff with cost engineering backgrounds are familiar with the preparation and use of progress monitoring curves, calculation of activity percentage completion, and planning for and implementing schedule related corrective action measures.

Cost Management – Cost management are those processes required to see that a project is delivered within the approved budget. Cost management includes cost estimating, budgeting, and cost control. All of these skills fall squarely within the purview of a trained cost engineer but not necessarily in those of a theoretical project manager.

Quality Management – Quality management are the project management processes necessary to ensure the delivered project functions as intended and meets the needs of all project stakeholders. Although quality management is not a core skill for a cost engineer, some of the techniques used in quality management are quite familiar to a skilled cost engineer. For example, cost/benefit analysis, flowcharting, calculating the cost of quality, trend analysis and value engineering are all techniques in which a cost engineer has training.

Human Resource Management – Human resource management are those project systems designed to make the best possible use of the people involved in the project. Due to a cost engineer's familiarity with resource planning, in this particular area, cost engineers probably have a leg up on staff planning, manpower leveling, and subcontracting.

Communication Management – Project communications management are those processes required to collect and distribute appropriate information concerning the project to the proper recipients in a timely manner. The one area of communication management where a skilled cost engineer is likely to excel is project performance reporting. Performance reporting includes status reports concerning where the project stands with respect to schedule and budget. It also includes progress reporting concerning planned versus actual progress, work in progress, etc. Finally, it includes forecasting or predicting where the project is headed based upon past progress and current trends. All of these communication management tools are quite familiar to a skilled cost engineer.

Risk Management – Risk management is the process of identifying, analyzing and responding to project risk events. Of a great deal of importance to a project manager in the risk management area are the terms and conditions of the contract as most contracts go to some length to assume, assign or transfer the risk of a variety of events that may occur during project performance. Other areas of risk management familiar to a skilled cost engineer include layout risks, resource overloading, activity interferences, coordination of subcontractors and vendors, and documentation reviews. Qualified cost engineers are also familiar with sensitivity, decision tree, trend, and probabilistic analyses.

Procurement Management – Procurement management are the processes necessary to obtain goods and services from outside the organization for the prosecution of the project. Areas of procurement management that fall within the expertise of a skilled cost engineer include market condition analysis, make-or-buy analysis, alternative selection, commitment curves, work package definition, project financing, contract type selection, independent estimates, and financial modeling. Additionally, analysis of change requests, implementation of contract change control systems, performance reporting, and operation of a payment management system are also skills that a qualified cost engineer will have. As before, a skilled cost engineer will bring much more experience to a project in these areas than a theoretical project manager.

Safety Management – Safety management are the processes required to insure that the project is executed safely – no accidents, no injuries, no property damage. Depending upon the nature of the project, safety management can be a highly complex area of project management. The skills that a qualified cost engineer brings to this area of project management are budgeting, analysis of decreased insurance costs, and analysis of resulting improved productivity.

Environmental Management – Environmental management are those processes necessary to ensure that the project is executed in such a way as to not violate various governmental permits, regulations and conditions. Again, depending upon the nature and location of the project, this can be a very technically complex part of project management. The three areas of environmental management that a skilled cost engineer can easily assist in are budgeting, alternative selection, and risk analysis.

Financial Management – Financial management of a project are the processes to manage the project's financial resources and centers primarily on project revenue and cash flow. Financial management is one of the core competencies of a qualified cost engineer. Areas that a cost engineer has some degree of expertise in include estimating project cost and duration, assessing risk, implementing a financial plan, establishing cost and revenue baselines, analyzing the cost of changes, performing cash flow analysis, preparing financial reports, and analyzing potential corrective action plans. A skilled cost engineer is much more likely to successfully implement these processes than one who is a theoretical project manager.

Claim Management – Project claim management are the processes needed to avoid or prevent claims from arising in the first instance or to properly analyze and resolve them if they do arise. Claims management is also a strong competency of a skilled cost engineer simply because cost engineers spend a great deal of time involved in project claims and disputes from a cost and schedule perspective. Particular areas where a cost engineer can contribute to claim management include claims for extra work, claims for additional time, impacts of changes and delays, estimates of claims damages, schedule analysis, and analysis of both direct and indirect costs.

The conclusion I reach from this analysis is that project managers with a cost engineering or project controls background are far more likely to be successful than theoretical project managers. Individuals with business, design, software or hardware backgrounds are all likely to be reasonably competent in their own technical fields before their organizations choose to elevate them to project manager status. However, most of the skill requirements of project management go well beyond technical matters. A technically competent individual who is well versed in project management theory but lacks a cost engineering or project controls background is much less likely to spot negative trends early and less likely to take timely and appropriate

corrective action. Thus, theoretical project managers are more likely to be in serious trouble before they even realize it than project managers who are skilled cost engineers.

Cost Engineering – Stepping-Stone or Career?

Having spent some time arguing that a cost engineering or project controls background will make someone a better project manager, should we consider cost engineering merely a stepping-stone on the way to the ultimate goal – project management? Well, I would argue that for some, this may be true. A lengthy stint in the project controls/cost engineering group of an organization might be the final training ground prior to becoming qualified to be a project manager. In the construction industry where I come from, there are a number of firms that have this as a condition precedent to project management.

If this is an organizational policy, then I applaud the organization for their foresight and commitment to train or obtain top-notch project managers. I'm confident the organization will benefit from such a policy. I firmly believe that projects managed by such individuals are much more likely to be successful – on time, in budget, with desired quality and safely delivered. If an individual chooses this route to project management, then they too are to be applauded for taking such initiative. I'm confident their careers will be significantly enhanced,

On the other hand, for many cost engineering or project controls is a career in and of itself. Cost engineering covers such a multitude of skills that many find it both challenging and rewarding. This is well and good. However, I would offer a challenge to the career cost engineer. Part of your function on projects should be to mentor younger staff. In the construction industry, it is not at all uncommon for projects to last two to four years. This is sufficient time to train technical staff in the skills of cost engineering. You can significantly and positively influence the careers of those who aspire to become project managers. If you are willing to spend the requisite time and effort to do this, you may even play an instrumental role on future projects – whether you're on them or not!..

Conclusion

Let there be no misunderstanding. There will always be theoretical project managers in our midst. As long as professional organizations offer theoretical training and certifications based on project management concepts there will be individuals attaining certification simply to advance their careers. Such project managers will, more likely than not, be found running projects that end in serious trouble. Skilled cost engineers on the other hand, have the requisite training and background to spot problems before they become serious challenges to project success and craft workable solutions. I am firmly convinced that cost engineering, whether a stepping-stone or a career, provides significant benefits and advantages for both its practitioners and the projects they manage.