

The Impact of Effective Project Control Plans on Buildings Construction Projects

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Abstract

One of the biggest challenges for Engineering, Procurement, and Construction Management (EPCM) companies is retaining control over the continuous health of medium to large scale projects, and more specifically, understanding the current status of the project in terms of cost, schedule, resources, progress, and performance at any given point of the project's life cycle. Since the construction industry has always been cost and schedule conscious; however, in lean economic times, that consciousness becomes more important than ever before. An effective, well-defined, easily understood, and dedicated Project Controls Plan (PCP) is the foundation of any successful project. This paper has focused on the impact of effective project control plans on building construction projects.

Key words: Construction - Impact - Project Control - Benefits - Cost - Schedule

1. Introduction

At the upper level of the project management process is project control. It can be part of the daily responsibilities of the project manager, or it can be under the authority of the more specialized project analyst. Project control combines the management skills of the project manager with the analytic focus of the professional accountant.

In today's commercial construction market, adhering to a schedule and maintaining a delivery date within the planned budget often define the difference between success and failure. Contracts carry substantial penalties for performance failures in the form of liquidated damages as well as the actual and consequential damages that may result from the delay¹.

Cost and time of construction projects are controlled with the objective of delivery within a predetermined time and a cost budget. Determining these objectives is the starting point of project control because it serves as a baseline to measure against².

¹Wayne J. Del Pico, **Project Control - Integrating Cost and Schedule in Construction**, John Wiley & Sons, Inc., Hoboken, New Jersey (2013)

²Yakubu Olawale, Ming Sun, **Construction project control in the UK: Current practice, existing problems and recommendations for future improvement**, International Journal of Project Management 33 (2015) 623–637

1. Function of Project Control

The *PMBOK*® defines Project Control with the following statement: “A project management function that involves comparing actual performance with planned performance and taking appropriate corrective action (or directing others to take this action) that will yield the desired outcome in the project when significant differences exist.”³ Project control is the function of integrating cost and schedule data to establish a baseline or guidance system for monitoring, measuring, and controlling performance. Project control can be performed by the project manager or can be an independent discipline within the project team performed by the project analyst or project auditor. Project control is the aspect of the project management process that provides the analytic tools for keeping the project on track, on time, and within budget.

2. Symptoms of Poor Project Control

Time and cost can easily get out of control on a construction project, even on a small project. While these two variables are independent, they are closely linked on all construction projects. Changes to schedule can affect the cost and vice versa. (We have all heard stories of projects that ran 30 percent over budget and six months late in delivery. How can this possibly happen? In most cases, lack of or loss of control is the underlying factor). There are many symptoms which show that the project is out of control.

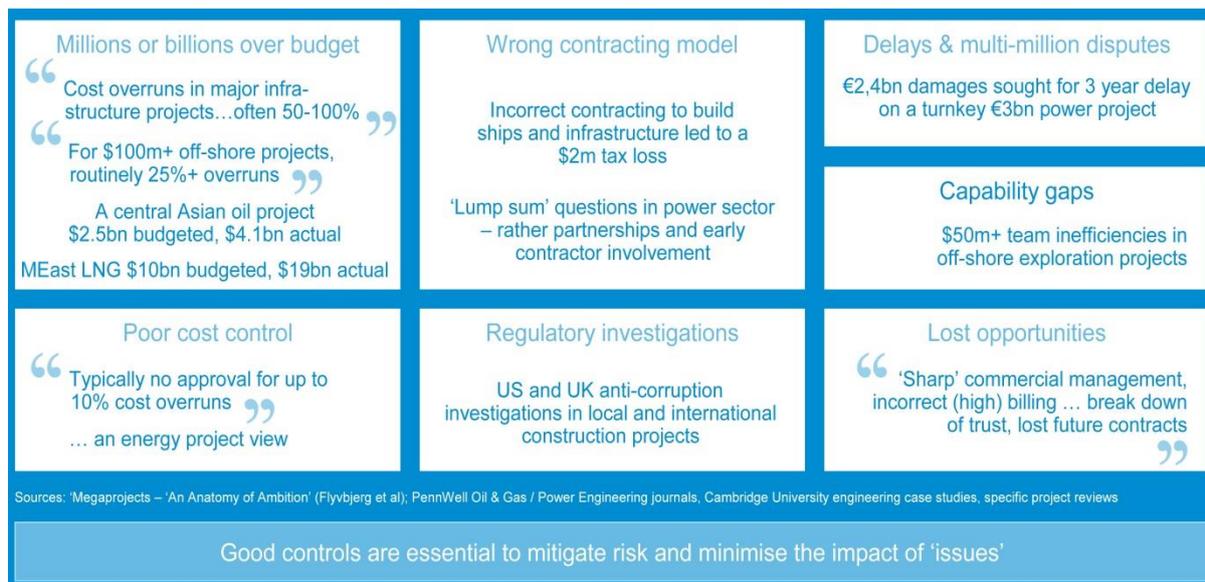


Figure 1: Significant delays and cost overruns for major projects show these are often not ‘in control’ and control objectives are unclear⁴

³A guide to the project management body of knowledge (*PMBOK*® guide) - Fifth edition, Project Management Institute, Inc.

⁴Capital Project Services Middle East, **Establishing a basis for effective project control**, <http://www.pwc.com/m1/en/services/deals/cps-effective-project-control.pdf>.

3. Project Control System

To avoid the disasters result from poor project control, there needs to be a system for measuring the actual performance (in both time and cost parameters) against anticipated performance. The system for measuring progress has to be dynamic and ongoing during the life of the project. Waiting till the last minute to discover your project will deliver late is not only unacceptable, but offers little time (or hope) to recover. Equally, important is the cost to deliver. Most construction contracts have a fixed price, or at the very least some form of accountability for the cost of the work as well as a time allotted for performance of the work. These two basic parameters create the foundation of project control.

Controls are instituted early in the project before the actual production tasks begin, and they are fully functional until the conclusion of the lessons learned meeting and the archiving of the project files.

While some companies have universal control systems that are applied across every project, each project should be evaluated separately for the appropriate level of control required. Large, complex, one of a kind projects with high risk generally require more control systems than small simple projects where the risk can be managed or loss to the business would be minimal. However, there are no hard and fast rules, each project should be evaluated on its own characteristic. With too few controls, the project status is never really known. Too many controls can be cumbersome and costly to maintain, and also distract from the real project goal.

Control systems are typically established at a minimum for:

Schedule – Cost - Contract modifications – Risk – Quality – Resources

The success of a project depends on employing the correct project management control system. It is important that the project managers design a robust project plan which can be done through efficient control methodologies. The project managers are also responsible for developing an appropriate project control system which is an essential part of project management effort. According to a survey, following good project management control practices reduces project failures by fifteen percent. The survey also revealed that the project performance can be enhanced if dedicated project controls systems are employed by an organization⁵. This infographic focuses on different components of a project control system (project estimation - project budget- EVPM - controlling cost - project scheduling - performance measurements).

⁵**Project Control System,**

<http://www.greycampus.com/blog/project-management/project-control-system>



Figure 2: This infographic focuses on different components of a project control system⁵

Another project control system use (Cost Estimating, Scheduling, Risk Management, and Document Control):

Cost, schedule, and budget are key elements of delivering a project, large or small. These elements can be effectively managed through cost estimating, schedule management, system management, and risk management. Companies use project control systems to provide stakeholders with reliable, accurate information that can be used to make decisions necessary to successfully deliver projects⁶.

⁶Project Control, <http://www.srfconsulting.com/services/project-controls/>

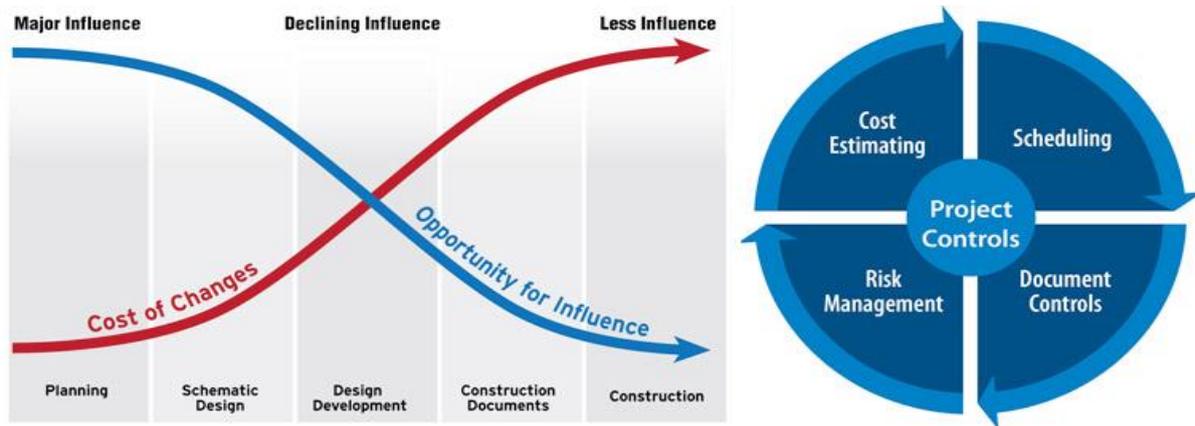


Figure 3: This infographic focuses on different components of a project control system (SRF Company-USA)⁶

Establishing a basis for effective project control depends on identifying control gaps to assess achievement of the project control objectives and management areas drawing on good project practice as shown in the following figure.

Project Management Areas		Performance Control Objectives	Questions to Address	
Change Revenue	Business & Regulatory Environment	Business revenue/benefit will be realised	<ul style="list-style-type: none"> How well defined are the required project process controls? Does project documentation and reports indicate that these processes are operating? Do these findings suggest that the performance control objectives are likely to be met? Are key control gaps shown as risks in the risk register? 	
	Scope & Change Control	Impact of any changes are understood and managed		
Delay	Time Management (Schedule)	Key upcoming milestones will be met		
Quality	Quality & Inspection	Technical, HSSE requirements met		
Cost	Cost Management	Actual & forecast vs planned cost variances are authorised		
Stakeholders	Communication & Reporting	Stakeholders ok & team / suppliers are performing	Criteria to Assess Achievement of Performance Control Objectives The maturity of control processes is the basis for assessing whether control objectives are met, in line with their criticality. Processes which are assessed 'Not Achieved' require agreed improvement plans	
	HR Management			
	Procurement & Contracts			
Risk	Risk and Issue Management	Issue impact understood + improvement plans		0. Nothing in place 1. Informal, not documented 2. Working practice, but not fully documented or tested / monitored 3. Documented and in place, but not tested / monitored 4. Documented and tested / monitored and reported 5. Optimised, gone through an improvement process to gain value – e.g. automated checks

Figure 4: Criteria to Assess Achievement of Performance Control Objectives⁴

4. Benefits of effective project control:

One of the most important responsibilities of the project manager is to control the project. Control in most cases can be defined as making decisions proactively instead of reactively to guide the direction of the project. Decisions must be made by taking into account all of the information available at the time and acting in the best interest of the project. Controlling the project includes making adjustments to both the plan and the schedule when things change, as they inevitably do. The PM must remember that there are always alternate methods for achieving the project goals. It is impossible to be proactive in every situation; occasionally, crisis management is the topic of the day. Great plans sometime change, and sometimes they just plain fail altogether. Unfortunately, that is just the nature of the business. How quickly the PM can get the project back on track is the essence of great project management¹.

4.1. Take Corrective Action

When the progress of the project falls short of the plan or deviates from the schedule, the project manager must be willing and able to take immediate and effective action to correct the deviation. The corrective action runs the full spectrum from written directives to termination. The actions necessary are determined as a result of analyzing all of the data in the feedback cycle, discussing the options with team members, and considering any potential consequences of those actions. It is essential that corrective action is applied in a timely and professional manner. Implementation of a corrective action has one goal, and that is to bring the project back on schedule. It is never intended to be punitive.

Not every action will have the desired or intended effect. In fact, it is not unusual for the corrective action to have no positive impact at all. Recognizing the mistake and switching to plan B is often the next step in the process. This project manager should not chalk this up as a failure, but as a step in the process of getting the project back on track. Inaction or waiting for the problem to correct itself are often far worse than the wrong action.

4.2. Achieve the Project Goals

In summary, the main duty of the project manager is to achieve the project goals. The planning, scheduling, monitoring, and controlling of the work are all designed and intended to further the project goals. The goals of the project are the goals of the project team. As the lead on the project team, the goals of the project manager are synergistic with the team. They are result of a clear understanding of the project documents made evident during the planning process. Some of the goals are contractual in nature, and some are imposed by the senior management. Understanding those goals and keeping them on target and in the focus of the project team is paramount to the success of any project and a primary responsibility of the project manager. Many projects become hopelessly derailed because the team loses focus of the goals or, worse, were unclear on what the goals were in the beginning.

4.2.1. Contractual Performance Obligations

Every contract for construction has specific requirements for performance. These include standards for quality of materials and workmanship, specific deliverables such as phases, and the most significant performance requirement—Substantial Completion. In their simplest terms, contracts define quality, time, and price. It is the primary goal of the project team to meet the performance requirements of the contract. Failure to meet these obligations can render the remaining goals on this list unattainable. The project manager and the project team must have a thorough understanding of the contract requirements.

4.2.2. Financial Objectives

While it may sound shallow or ignoble of purpose, all project managers are tasked with meeting (or exceeding) the financial goals outlined in the estimate or by the project team. That means the project should contribute its share to the company's financial bottom line. As with any for-profit business enterprise, making a return for managed risk is one of the determinants of project success. Project managers are often the gatekeepers to the profits. They are charged with the task of maintaining the estimated profit carried in the bid, in addition to the profit that comes from negotiating, effective decision making, controlling the participants, and superior management of the schedule. In the eyes of most construction executives, one of the most important measures of a successful project is the net profit it returns.

4.2.3. Prevent or Minimize Delay

The scariest word in the construction lexicon is “delay.” The principal reason is that recovery from delay can be very costly, if even possible. Once a project has experienced a delay, it can provoke a host of claims from affected parties: claims of losses from the owner, claims of material escalation costs, imposition of liquidated damages, and even additional charges from the architect and engineers for extended services. Resolving delay disputes is time-consuming and distracts the project manager from his or her real responsibilities in managing the project. Careful monitoring of a project schedule and control of the contractors performing the work can prevent or minimize delay.

4.2.4. Avoid Claims or Litigation

Claims for additional work as a result of delay, acceleration or escalation costs are normal occurrences on a construction project. Those claims that can't be substantiated and approved in the normal course of business often end up with a third party overseeing the resolution of the dispute. Preparing to litigate, arbitrate, or mediate a dispute is a burden on the project manager's time and can be all consuming. Since most actions to resolve disputes occur well after the incident, the project manager must review and study the project records and become reacquainted with the details. Avoiding claims or possibly the resulting legal actions is a primary responsibility of the project manager. It can very quickly turn a financially successful project into a loser.

4.2.5. Control the O-P-C Relationship

The O-P-C relationship is the tri-party arrangement most often used in the construction industry under the design/bid/build delivery methodology. The Owner (O) contracts with the Professional (P), most often an architect or engineer, for design and administration services. The Owner (O) also contracts separately with the Contractor (C) to construct the physical project. While there is no direct binding agreement between the professional and the contractor, there is a requirement that they cooperate in the interest of the owner to complete the project. As the party with the most financial risk, it is the project manager for the general contractor that needs to control the O-P-C relationship as well as the project team. The project manager must strive to earn the respect and trust of the architect and the owner so that he or she can be the proactive force in managing the project, instead of reacting to the wishes of the professional and the owner. A strong PM with a clear understanding of the project and its unique features, who can direct the work and maintain the project schedule, is the hope of every owner and design professional for their project.

4.2.6. Increase Market Share

In all businesses, a successful engagement, a well-executed contract, or the sale of a product that performs as advertised should increase business and add to a company's market share. The construction industry is no exception. There is only so much advertising that a company can do. Successful performance adds to a company's reputation and ultimately its bottom line. While it may not be the primary goal of the project manager to increase business, it should be an ancillary goal. It is the by-product of a project done well, and a reward for superior performance by the project manager.



Figure 5: Benefits of good project governance and control³

5. Conclusion

Project Control has a direct correlation to project progress and stake-holder's expectations. Projects rarely fail because of one issue. Rather, failure is usually a collection of minor items that individually have negative impact in a specific project area; however, when looked at over the life span of a project, these minor items can cause significant impacts to cost, schedule, risk, and can manifest themselves as deviations from the original Project Plan.

The key to successful project control is the fusing of cost to schedule whereby the management of one helps to manage the other taking into account the influential risks. This requires that a project's cost and its duration have a direct relationship, and not be just the scheduler's arbitrary assignment. Ensuring that relationship is correct and setting the appropriate baseline for tracking is the domain of the project control expert.

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