

Project Controls Team

Learning and Development Program



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Chapter 1: Introduction to Team Learning and Development in Project Controls

1.1 Project Controls Core Competencies

The project controls team is the part of a project management team that is responsible for keeping a project within the stipulated schedule and budget while meeting the performance parameters. Project control begins as early as the planning phase and ends with the successful handing over of the project to the client. It is essential for keeping a project on track throughout the project life cycle. Decisions made by the project controls team at every stage have a direct impact on the project schedule, budget and performance. Since these three factors are inter-related, a balance must be struck. This requires a well-trained and experienced project controls team because appropriate decisions made at the right time can increase a project's success. Communication between the project controls team and other departments is crucial for the successful execution of a project, since poor performance of one department gets carried over and affects the performance of the others. The collection of all project control competencies is known as the project controls and management system (PCMS).

Project controls core competencies consist of: estimating, planning, scheduling, cost control, change management, progressing, and forecasting.

Figure 1 shows the different functions that define a project controls team.



Figure 1. Project controls core competencies

1.1.1 Estimating

Estimating is an essential part of project controls since it becomes the baseline for subsequent cost control. A high estimate lowers one's chance of acquiring a contract, whereas a low estimate can result in losing money during the execution phase of a project. Therefore, well-trained and highly experienced estimators are critical to success. Estimators must have the ability to determine the requirements for labor, materials, time and costs for the project. They must also be able to develop a contingency amount to account for unforeseen changes in scope and fluctuations in both material prices and labor costs.

Team skills and estimating procedures have a significant impact on the accuracy of an estimate. Thus, developing these skills is necessary for producing good estimates and, in turn, for generating profits.

1.1.2 Planning

Project planning is the key to lowering project variability. Project success depends directly upon the level and quality of project planning. Substantial reduction of project costs can be achieved through proper planning. Planners tend to plan for labor and material items and prepare cost and schedule control tools. They must have the ability to foresee all control requirements that will arise during the project life cycle and must be able to communicate these to the project controls team effectively. This necessitates a good team learning and development program for improving the efficiency and effectiveness of the planning team. Three planning approaches are commonly used in the industry: front end planning, pre-construction planning, and jobsite planning.

Front end planning (FEP) for a capital facility has been defined as the process of developing sufficient strategic information for owners and contractors to address risk and decide to commit resources to maximize the chances for a successful project.

Pre-construction planning (PCP) is the planning that is performed to prepare a construction project for execution. In general, PCP begins during the preparation of the bid and ends shortly after the project has been executed.

Jobsite planning has to be done to ensure proper logistics of materials and labor on the jobsite, with safety as the priority. Strategic jobsite planning can result in the smooth flow of activities and increased labor productivity.

1.1.3 Scheduling

Scheduling involves ordering and sequencing the various project activities such that all activities finish at the planned time. This requires coordination among the various departments and teams. Making use of work breakdown structures (WBS) to schedule and control the project is typical. A scheduler must have the ability to prepare and ensure quality schedules that include WBS durations and resource loading.

Schedulers with skills and experience are in strong demand. Thus, a good training program is necessary to train the available schedulers to meet an organization's requirements.

1.1.4 Cost Control

A major concern while undertaking a project is cost. The project controls team must be able to catalog the budgeted and actual expenditures to identify cost problems, establish cost trends during the course of the project, and provide valuable cost data for the planning of future projects. The problems associated with cost management multiply as project size increases.

1.1.5 Change Management

One of the major concerns of a contractor or client is change. Changes may occur frequently on projects; thus, appropriate measures must be taken to manage changes. On average, one can come across hundreds of change orders throughout the project life cycle and these have a major impact on construction cost and schedule. Thus, the project controls team must be able to recognize, evaluate, and implement changes while seeking measures to minimize their impact.

1.1.6 Progressing

During the project execution phase, physical progress measurement, resource management, and productivity analysis all need to be performed in order to measure progress and detect possible pitfalls. The project controls team needs to implement appropriate and effective procedures for identifying performance parameters and measuring progress. Once these parameters have been evaluated, the team must interpret the trends and formulate corrective measures.

1.1.7 Forecasting

Problems often arise in a project during the execution phase. The success of the project controls team depends on its ability to forecast these problems and formulate mitigation measures that incur the least damages to cost and schedule. Productivity profiles, progress curves, and performance calculations give the project controls team an idea of how the project compares to the planned progress. This comparison can help the team foresee overruns. Hence, strong forecasting skills are necessary to keep the project within budget and on schedule.

1.2 Why Team Learning and Development is Important to Project Controls

With increasing competition in the construction industry, contractors must minimize their costs to compete and survive. The increasing prices of material and labor are adding to their challenges. Obtaining a reasonable profit after having produced a winning estimate is a challenging task and requires a dedicated effort by the project controls team. Thus, organizations often find it necessary to acquire highly experienced and skilled project controls personnel. Due to the scarcity of experienced personnel, contractors frequently are committed to training new graduates and recently hired employees.

Team learning and development programs train project controls personnel not only in technical areas of expertise, but also in areas pertaining to time management, risk management, and leadership development.

The following benefits may come with having an effective team learning and development program:

- Achieving consistency in project management
- Implementing common terminology, practices, and tools
- Improving project performance
- Keeping employees up to date and motivated
- Promoting high performance through demonstrated commitment to professional development
- Increasing exposure to new practices and tools
- Retaining employees

Apart from training and developing new employees, an effective team learning and development program can be used to train and develop existing employees. These more experienced employees can benefit from learning the latest and the best techniques utilized in the industry. Such training efforts motivate employees by empowering them to make confident and accurate decisions. This can be used as an effective retention strategy when coupled with strong career path opportunities.

All these benefits translate into improved project performance and increased profitability for the company.



Figure 2. Benefits of effective team learning and development program

1.3 Attributes of Effective PCMS Team Members

A strong PCMS team is the key to the successful execution of a project. The companies taking part in a recent survey were asked, *“What qualifications/key attributes do you seek in project controls personnel?”* What follows are the desired attributes in a PMCS team member, as articulated by the survey respondents.

1. Project controls personnel must possess thorough subject knowledge and technical skills, both in their specializations and in general project controls.
2. All companies are looking for ample experience. The number of experienced personnel is limited; therefore, a team learning and development program must be a part of new employee training.
3. Project controls personnel must have a strong academic background in construction management or project management. They must also be well versed in the areas of change management and scope control.
4. Another important attribute is excellent analytical skills. One must be able to properly analyze a project from available performance indicators and be able to take the necessary measures to bring a project back into control.
5. Excellent communication and interpersonal skills are crucial to project controls personnel. One major problem faced by most companies is the field personnel’s inability to communicate the actual problems faced at the project site to the office personnel. Since major decisions for the site are made in the office, it is essential that the problems be communicated with clarity and in a timely manner.

6. Awareness of current and modern developments in project controls is necessary in order to keep up with competitors. One must also have the skill and ability to apply these developments appropriately to benefit the company.
7. All the employees must have deep insight into, and be proficient in, the various systems used by a company. This can be achieved through proper training of employees.
8. Successful execution of a project requires coordination and understanding between the various members of a project controls team. Every member of the project controls organization must be a team player and be focused on working toward the overall success of a project.

1.4 How to Use This Implementation Resource

Every organization is unique and should develop a unique team learning and development program based on core competencies and business strategies. Contractors and owners both can use this publication as a guide to developing an effective team learning and development program. It provides insight into the characteristics of successful training programs already in use in the industry, including aspects such as skills assessment, career development, training sources, and certifications.

Chapter 2: Defining and Developing a Skills Matrix

2.1 Defining the Required Skills

The identification of skills is the key to creating an effective team learning and development program for project controls personnel. Skills and competencies should be defined for each project position and for each level, depending upon the company's objectives.

All technical and non-technical skills have to be defined and tabulated in the different matrices described below.

2.2 The Skills Matrices

The development of a skills matrix begins by defining the competencies and skills for each position and level. Every matrix varies according to the company's goals, the nature of projects undertaken, and the project controls team.

The skills matrix should incorporate a detailed description of the tasks, general duties and responsibilities, skills required, experience needed, and training required, along with the company's required proficiency level (see Figure 3 at the end of this chapter). It should include both the technical and the non-technical competencies needed for a specific project controls position. Technical competencies can include both the competencies specific to the specialization (e.g., estimating) and the general project controls areas.

The skills matrix helps employees determine the requirements for different positions, allowing them to plan their career paths accordingly. Figure 3 shows a sample skills matrix for estimators. All the technical and non-technical competencies are measured in terms of proficiency levels (Basic, Intermediate, Advanced and Expert). Experience in different specializations is measured in years. Training completed and not completed is noted for each of the training courses.

Detailed knowledge requirements are portrayed with the help of a training matrix (see Figure 4 at the end of this chapter). This matrix annotates the training and education a controls specialist has completed in order to achieve competency at various proficiency levels. Details about the experience needed and skills required are also furnished here.

The various courses that need to be taken in order to achieve the desired level of proficiency should be listed in the training matrix. For maximum utility, the matrix should provide the sources of training for the various courses listed in the matrix. Figure 4 shows a sample training matrix that can be used as a template.

The individual skill level of project controls personnel are represented using an individual skills matrix (see Figure 5 at the end of this chapter). The individual skills matrix tabulates each skill that the employee has developed along with the respective proficiency levels. It includes both technical and non-technical skills. Details on training and experience are also included in the individual skills matrix.

The individual skills matrix can be used to compare the employee's skills with those required for the position in question. This can be done by superimposing the individual skills matrix and the skills matrix, and then performing a gap analysis. Once the gaps have been identified, the skills or competencies are matched with the training matrix and the appropriate training programs can be recommended. This has been illustrated graphically in Figure 6.

Sample matrices for an estimator and scheduler are identified in Appendix C. Organizations can use these samples as a guide for establishing a complete set of training matrices. Templates for all the three matrices are provided in Appendix A.