



Construction Industry Institute®

Global Project Controls and Management Systems

Construction Industry Institute

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Executive Summary

Project Controls and Management Systems (PCMS) includes the people, processes and tools for the planning and execution of all phases of capital projects including, but not limited to, Estimating, Cost Control, Planning, Scheduling, Change Management, Progressing, and Forecasting. PCMS has received scant research in the last two decades and there is a popular impression that the principles of PCMS have changed due to many influences, including globalization and information technology. To update PCMS knowledge, the Construction Industry Institute (CII) chartered a research team of project controls experts. The research team reviewed modern PCMS practices, identified areas that need improvement, and provided recommendations and guidance for improving PCMS.

The research team concluded that the principles of PCMS functions that were established in the 1960s and 1970s are still valid today. However, the environment in which modern day construction projects operate has changed dramatically and PCMS needs to adapt accordingly. The drivers of the changing environment are captured in 13 trends:

1. Sophistication of information technology
2. Project complexity
3. Speed of project execution
4. Recognition of changes
5. Changing owner organization direct involvement
6. Globalization
7. Outsourcing
8. Graying of PCMS
9. Contractor specialization
10. Increase in regulatory oversight
11. Distribution of project risks among and within organizations
12. Virtual performers on project teams
13. Labor and materials availability and price elasticity

The research team provided recommendations regarding how to adapt PCMS to the modern project environment, as well as how to improve interface management, forecasting, and PCMS learning and development. These recommendations are presented in four separate Implementation Resources as well as a Research Report. This document summarizes the principal findings and provides an introduction to the Implementation Resources.

Introduction

Project Controls and Management Systems (PCMS) are central to effective project execution. PCMS can improve the delivery schedule for faster time-to-market, help reduce capital cost, provide the basis for informed decision making, and help manage risks. In the words of one CII member company in response to the team's survey:

"A strong PCMS capability is vital to the success of the company... We consider it to be a significant differentiator in the eyes of ourselves and our clients."

The research team (RT244) survey of CII member organizations elicited 53 responses (28 owners, 25 contractors) indicating strength in the functions of planning, scheduling, estimating, and cost control. However, they indicated weakness in the functions of change management, progressing, and forecasting. In addition, firms indicated poor transition of PCMS information across interfaces. Core competency training was also seen as a consistent area of weakness among firms. While there was some variation between owners and contractors as well a range of performance noted, the findings are broadly applicable and are consistent with experience of the RT244 industry team members.

Based on the expertise of the team and findings of the survey, the team focused its subsequent efforts on areas of leverage to improve PCMS implementation. In particular, the team chose to focus on effective implementation of PCMS processes and procedures. Four focus areas were developed that resulted in four Implementation Resources. These are IR244-2: *Adapting Your PCMS Program for Success*; IR244-3: *PCMS Interface Management*; IR244-4: *Best Practice Forecasting*; and IR244-5: *Project Controls Team Learning and Development Program*. The first captures the broad trends affecting PCMS implementation and contains recommendations for systematic assessment and improvement. The second addresses the need for improved interface management. The

third address the weaknesses in forecasting (and progressing supporting the forecasting function). The fourth addresses the need for improved education about PCMS principles and practices.

A decision was made to not explicitly focus on information technology as this can change the form and frequency of PCMS reports, but can obfuscate the need for effective processes and analysis. The observed weakness in change management was not chosen as a focus area as there are recent CII publications and research in this area. In addition the team chose not to address the subjects of “there is no such thing as a no impact change” and “aborted as opposed to rework.”

Methodology and Data Analysis

Research Team (RT) 244 was broadly chartered to provide a comprehensive review of modern PCMS practices to provide guidance to CII member organizations as they seek to adopt leading methods. The team charter objectives were to (1) document the state of practice of PCMS as implemented by CII member organizations, (2) identify the principles of PCMS process that are still valid and highlight improvements, and (3) evaluate existing CII research and implementation publications relating to PCMS and make recommendations for archiving, validating, and updating these documents. Within this charter, the research was conducted in two phases. The first phase addressed the current state of PCMS practice and review of the existing CII publications. The second focused on highlighting improvements.

Research for the first phase of the research used a mixed method approach that collected data through a survey of CII member organizations as well as through a series of structured discussions with the research team. The survey was developed by the research team at the kickoff meeting and submitted to the CII membership. Fifty-three surveys were returned (28 owners and 25 contractors), representing approximately half of the CII membership. The survey (detailed in Research Report 244-11) examined PCMS practice along the seven PCMS functions in each of the project phases. Questions were also asked about plans for investment in PCMS, and transition of information across phases. Averages and variances for each response were totaled by academic team members and reviewed by the industry team. Further input by the team included a series of structured discussions around specific PCMS topics, ranging from brainstorming to a structured session to understand how important the team members felt each PCMS function is to project success in each phase as well as degree of change in practice in that function and phase. Team members were also asked to review CII publications related to PCMS. This mixed method approach was able to systematically elicit