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Quantitative Measurement of Project Manager Competencies

Construction Industry Institute

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Quantitative Measurement of Project Manager Competencies

**Prepared by
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Research Team 306, Quantitative Measurement of
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**Research Summary 306-1
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Executive Summary

Construction organizations have historically used past relationships, familiarity, and feedback from colleagues to evaluate project manager (PM) competence. In many cases, this qualitative approach may have led to insufficient development of needed competencies and inappropriate assignment selections. The Construction Industry Institute (CII) chartered Research Team (RT) 306, Quantitative Measurement of Project Manager (PM) Competencies, to develop a list of key PM competencies and create a tool to measure them in a reliable and consistent quantitative manner. The team created and distributed a survey to CII members. To obtain the accuracy of a knowledgeable outside source, the team administered the survey to PMs' direct supervisors, allowing for an objective understanding of the PMs' competency levels. The supervisors were asked to answer the survey questions twice: once regarding their most "stellar" (excellent) PM and once regarding an average-performing PM. The research team then developed the Project Management Competency Assessment Tool (PM CAT). The tool should be used to measure the competencies of PMs managing all or parts of typical engineering, procurement, and construction (EPC) project phases. The tool may also be adapted to evaluate PMs for a broader set of projects.

The team designed the PM CAT to identify competency gaps and, thus, pinpoint training and development opportunities for PMs. Because it is replicable and versatile, the tool can be widely used by contractors, subcontractors, owners, architect/engineers, and other types of EPC companies. Consistent use of this tool will help construction organizations improve project performance by increasing their ability to do the following: 1) assess the competencies of a successful PM; 2) identify overall training and developmental needs to improve effectiveness; 3) improve individual training by pinpointing specific needs; and 4) enhance the selection process of qualified PMs for placement on construction projects.

Introduction

Project managers are the individuals charged with leading project personnel and allocating resources to realize project goals while honoring project constraints (CII RT 281). Their leadership is essential to the success of EPC projects, and they are often responsible for a project's outcome. Project managers must have the necessary technical and leadership expertise, training, and characteristics to succeed in this role. In addition, for consistently high project performance, it is essential that they continuously improve their skills through development and training.

Past CII research into PM skills identified a set of skills and attributes necessary for PMs to meet industry changes and challenges over the next decade. Performed by Research Team (RT) 281, Project Management Skills for the Future, this study identified four categories of PM skills and attributes: 1) technical/virtual, 2) management, 3) cognitive, and 4) leadership. While this research identified the necessary skills and attributes for PM capability, it did not provide for quantitative evaluation of current PM competencies or any determination of training gaps. Therefore, the need remained for a standardized methodology for assessing PM competencies with reliable quantitative measures. Because such quantitative identification of training gaps would greatly benefit the industry, CII chartered RT 306, Quantitative Measurement of PM Competencies, to meet this need for a quantitative method of assessing PM competencies.

The RT 306 research mandate was to produce a tool that could narrow down and define the competencies necessary for PM success, facilitate competency evaluation for current PMs, identify training and developmental needs, and enable construction organizations to assemble high-performance teams. To fulfill these objectives, the research team developed the Project Manager Competency Assessment Tool (PM CAT). The PM CAT is a user-friendly tool that offers a method of assessing PM competency on an industry-based scale to identify training and development gaps.

The research team pilot-tested the tool to verify that its results are consistent and continuous among PMs from different companies and backgrounds. All types of EPC stakeholders can adapt it for best use. The PM CAT will help users improve PM effectiveness by targeting specific development needs in a personalized and efficient manner. The deployment of the PM CAT will help to improve PM performance and support the CII mission to improve overall industry performance.

Research Methodology

The research methodology consisted of four main steps as shown in Figure 1 and detailed below.

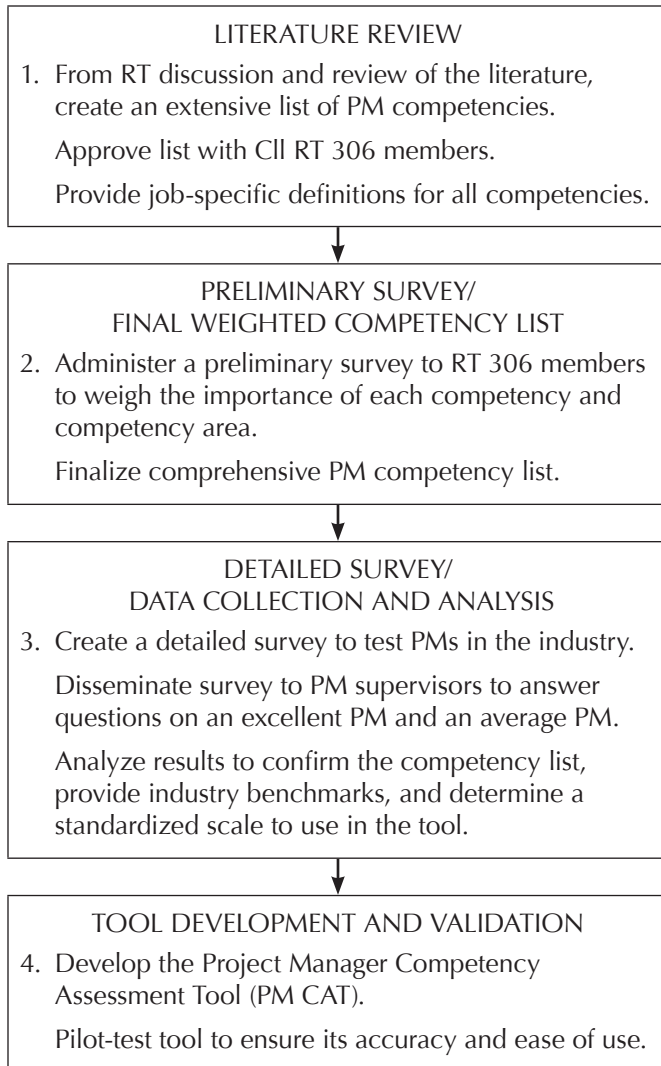


Figure 1. Research Methodology

Step 1 – Literature Review and Competency List Development

The first step of the research was to perform an extensive literature review, to identify, define, and weight all critical PM competencies. The review also confirmed that the industry needed a simple and quantitative project manager competency assessment tool. After reviewing existing competency modeling tools and other similar scholarly material, the research team identified and compiled a list of necessary skills, attributes, knowledge, and characteristics required to succeed as a PM. The team adapted the RT 281 four-category schema and used it to organize the PM competencies it compiled from the literature. (Appendix A presents the four categories and a full list of the competencies under each one.)

In addition to adapting the RT 281 research, RT 306 drew on the three areas of the Project Manager Competency Development (PMCD) framework—knowledge, personal, and performance—developed by Project Management Institute (PMI) to separate and organize the competencies of a successful PM. Released in 2002, the PMCD framework is a reference tool that gives project managers, supervisors, and organizations guidance on assessing, planning, and managing PM professional development.

After establishing and defining the four competency categories, RT 306 listed all the PM competencies it had identified from its review of competency models and PM literature, taking care to eliminate redundancies. Figures 2 and 3 each present a well-developed example of the competency models the team studied: the National Aeronautics and Space Administration (NASA) leadership competency model for management, and the Corporate Education Group project management competency model.

NASA is the U.S. government agency in charge of the nation's space program. The NASA leadership development framework serves as a basis for assessing and developing employee leadership skills. Such leadership competency models clearly display the skills and knowledge required to be a leader at NASA, and they offer guidance on the development of these skills. RT 306 studied and used many of the competencies in this management-specific model (NASA 2008). (The management model is one of five available NASA leadership competency models.)

Corporate Education Group (CEG) is a provider of corporate training, certification, and consulting services in business and leadership fields. CEG specializes in providing relevant and actionable solutions to project management training and performance. To create the set of necessary PM skills and attributes in its competency model, the organization paired its business and leadership component with the PMI Competency Development Framework (CEG 2012).

Using these and similar models, RT 306 put each competency on an extensive PM competency list under the four competency categories adapted from the RT 281 research. The research team developed precise job-specific definitions of each competency. (See Appendix B for the full list of these competency definitions.) The final PM competency list comprises 49 competencies, distributed appropriately across the four main categories. (See Figure 4.) After generating this list and organizing it into categories, the team incorporated the competencies to develop its preliminary and detailed surveys. The competency list also ultimately provided the basis for the framework for the PM CAT.



Figure 2. NASA Leadership Competency Model for Management (NASA 2008)