HOW WELL ARE PMs DOING?
INDUSTRY VIEW OF DEFENSE PROGRAM MANAGER COUNTERPARTS

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Large, complex defense acquisition programs have been plagued by cost overruns, delayed schedules, and subpar performance. Much of the responsibility has been attributed to weaknesses in competencies of government program managers (PM). This study provides a new perspective on government PM competencies by surveying defense industry managers who work with the government PMs. Data gathered from a survey of 146 industry managers rated the importance of common PM competencies and assessed how well, from their perspective, their government counterparts met those competencies. The data also revealed several insights, including a conclusion that government PM performance on several key technical skills may need improvement. The results of this study will be useful in assessing training and development strategies for government PMs.

Keywords: *Program Management, Competencies, Skills, Leadership, Organizational Behavior*

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Surveying you!

The Government Accountability Office (GAO), an independent investigative arm of the U.S. Congress, reported in 2008 that the Department of Defense (DoD) had $1.6 trillion in commitments for weapons systems acquisition programs, with estimated cost growth of $295 billion and average schedule delays of 21 months (GAO, 2008, p. 4). Indeed, for the past several decades, news reports of $600 toilet seats, poor performance of battlefield equipment, and cancelled programs have been all too commonplace (Besselman, Arora, & Larkey, 2000; Samuel, 2003). The Defense Acquisition Program Assessment (DAPA) Report of 2006 (Kadish, 2006) more recently asserted that:

> Both Congress and the Department of Defense senior leadership have lost confidence in the capability of the Acquisition System to determine what needs to be procured or to predict with any degree of accuracy what things will cost, when they will be delivered, or how they will perform. (p. 1)

DoD program managers (PM) have come to bear much of the responsibility for these overruns in cost and schedule (GAO, 2005; Kadish, 2006). In the DAPA report, "program manager's expertise" was identified as one of the top five issues contributing to the poor program performance (Kadish, 2006, p. 3); and in 2008, the GAO commented that the DoD needed to "strengthen training and career paths as needed to ensure program managers have the right qualifications for running the programs they are assigned to" (Sullivan, 2008, p. 16). Part of the solution to improving acquisition program outcomes, then, may lie in identifying and improving specific *competencies* of the program managers themselves.

This is not a simple undertaking. Most who understand the job of the program manager in defense acquisitions appreciate the breadth of knowledge, *skills*, and abilities he or she must possess in several competencies, including:

- The PM must be *technically* competent, able to manage technology and system engineering as well as software and information systems, and understand manufacturing and industrial processes.
- The PM must demonstrate key *business* competencies such as financial management, contracting, and cost estimating.
- The PM must exercise *leadership and management* competencies in developing and executing the program strategy, managing core processes, and dealing with the day-to-day management challenges of a large, complex program.

Fox and Miller (2006) summed up the need for this broad and comprehensive PM competency set by stating:

> Managing [a large complex project] is more than a science; it is a continually evolving art… Managers must augment a strong foundation of conventional management skills in planning, organizing, and controlling, with knowledge of the requirements, resources, and constraints of a specific project as it progresses. (p. 109)

Given the expansive portfolio of required competencies, one might question whether some competencies are more important to program success than others. For example, research by Bauer (2006), asserted that *management* competence is more important for defense and aerospace industry program managers than *technical* competence. Likewise, Gadeken (2004) reported research from government PM self-assessments that suggested leadership and management skills were more important than technical skills.

Once critical PM competencies are identified, the next logical inquiry would be into which of those competencies PMs might be demonstrating systemic weaknesses. If important competencies can be identified, and weaknesses among those discovered, perhaps focused training and development remediation can be applied to improve these PM competencies, and thus impact program performance.

To try to address this opportunity, this exploratory, quantitative study began with a set of 35 specific technical/business ("hard skill") and leadership/management ("soft skill") competencies and attempted to determine which were perceived as most important in contributing to program success, and how well PMs were performing against those competencies. To minimize bias associated with self-surveys, a sampling of experienced defense industry managers was invited to participate in a survey that asked them to objectively assess the skills and abilities of their government counterparts. This approach provided a unique perspective on government PM competencies that had not been explored previously in the literature.

Research Method

While most competency studies in the literature involved collecting data from PM self-surveys or, in some cases, surveys of PM supervisors (Besner & Hobbs, 2006; Cheng, Dainty, & Moore, 2005; Gehring, 2007; Muzio, Fisher, Thomas, & Peters, 2007), this study attempted to use a fresh approach. Here, defense *industry* PMs were surveyed and asked to provide their perceptions and assessments of the core competencies of

their government counterparts. Industry PMs were selected because they are in a singularly distinctive position to be able to assess their government PM equivalents. Government and industry PMs typically work very closely together on defense programs, providing the unique opportunity for these industry managers to closely observe their government PM counterparts and contribute rare and valuable insights to this study.

Key competencies of the government PMs were measured using a survey instrument originally developed by Golob (2002). The survey instrument was based in part on Project Management Institute (PMI) competencies and modified for the purposes of this investigation. Survey validity and reliability were verified through expert evaluation, pilot surveys, and standard statistical methods.

The competencies included 20 technical/business, or "hard skills," and 15 leadership/management, or "soft skills," as shown in Table 1. Survey participants were asked to address two questions. First, which government project management competencies among the 35 given are most important for program success? Participants responded to the list of competencies, rating the relative contribution of each to program success. Each competency was listed on the questionnaire with Likert scale choices of *Very Important, Important, Neutral, Unimportant,* or *Very Unimportant*. The second research question put to the industry managers was how well government PM counterparts performed against each competency. The Likert scale observations included ratings of *Expert, Good, Average, Fair, Poor,* and a no-response choice.

Participating in the survey were 146 industry managers, providing a good statistical basis for insights into PM competencies. Demographic information from the survey revealed that the sample included a large proportion of senior industry managers with substantial experience managing complex defense programs. The survey demographics are depicted in the Figure. The data also show that the industry managers had frequent contact with their government counterparts, lending credence to their observations.

Results

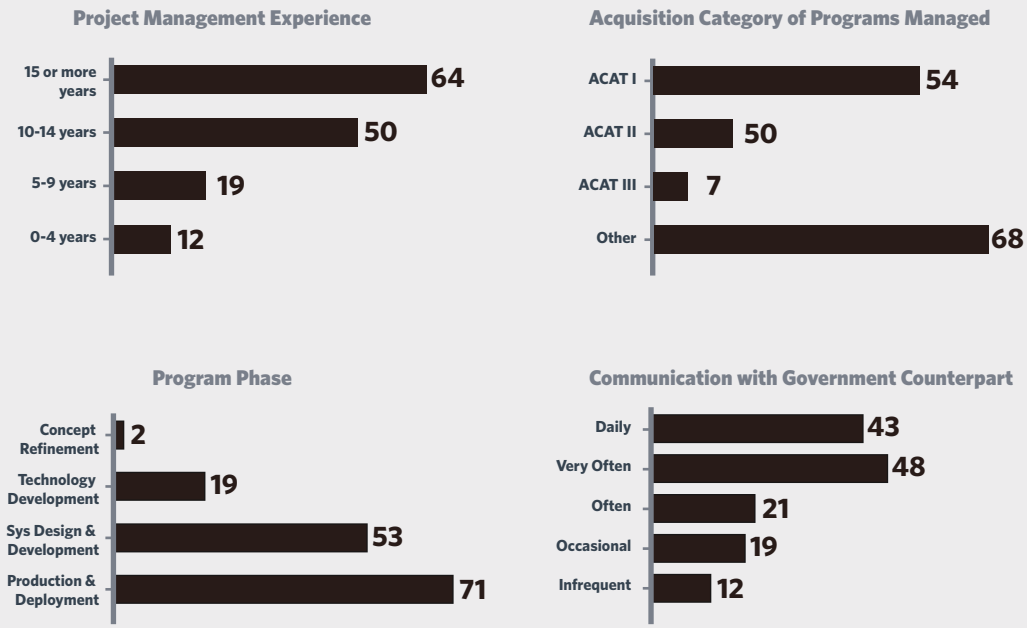
COMPETENCY IMPORTANCE TO PROGRAM SUCCESS

To address the importance of each competency to program success, the mean scores for each competency were compared and rank ordered. A higher average score indicated that the industry managers perceived this particular competency to be a more important determinant of program success. Table 1 shows the means ranking of the importance data. Since the survey was based on a mature set of widely accepted competencies,

TABLE 1. SURVEY COMPETENCIES AND DEFINITIONS

Hard Skills (C1–C20)	
1.	Determine program goals, requirements, and specifications
2.	Determine program scope and deliverables
3.	Technical ability
4.	Document program constraints that could affect program completion
5.	Document program assumptions
6.	Define program strategy or alternative approaches
7.	Quality assurance
8.	Identify resources requirements
9.	Develop a budget
10.	Create a work breakdown structure (WBS)
11.	Develop a schedule
12.	Develop a resource management plan
13.	Establish program controls comparing actual against planned performance
14.	Develop program plan
15.	Communicate program status
16.	Measure program performance to identify program trends and variances
17.	Implement corrective action
18.	Implement change control
19.	Respond to risk
20.	Conduct administrative closure of the program upon completion
Management/Leadership (Soft Skill) Competencies (CS1-15)	
1.	Project leadership
2.	Flexibility to adapt and deal with situations and manage expectations
3.	Sound business judgment
4.	Trustworthiness
5.	Communication style presents clear and unambiguous information without bias
6.	Listening skills
7.	Setting and managing expectations
8.	Negotiations
9.	Issue and conflict resolution
10.	Organizational skills
11.	Coaching
12.	Facilitation
13.	Decision making
14.	Problem solving
15.	Team building

FIGURE 1. SURVEY DEMOGRAPHICS



industry managers rated most of the competencies very highly in importance to project success.

The highest rated competencies represented a relatively even mix of technical and soft skills. The most valued hard skills were the ability to *determine program goals and deliverables* and *develop a program budget.* These results were not surprising. Among others, Pinkerton (2003, p. 53) pointed out that the first criterion for project success is to have clearly defined goals and objectives. It is important for the government to specify the deliverables from the project, and it is equally important for industry, because deliverables define the government's expectations in concrete terms. Similarly, a sound program budget is important to match resources to goals and deliverables.

The most highly rated soft skills included *trustworthiness, project leadership,* and *decision making.* Trust and trustworthiness are keys to proper organizational and interorganizational functioning and have been documented in the literature (Jehn & Mannix, 2001; Joseph & Winston, 2005; Wells & Kipnis, 2001). Trust may be particularly important in large, complex projects where not every expectation can be instantiated in the government-industry contract. Trust and understanding between the government and industry managers are essential to minimize conflict, foster cooperation, and jointly succeed.

Similarly, project leadership in a complex defense project is required to establish the vision and goals, motivate the team, and gain commitment to program success. The third-ranking attribute, PM decision making, is

TABLE 2. COMPETENCY SCORES FOR IMPORTANCE

Competency Designation	Competency Description	M	SD	Ranking by Mean
C 1	Determine program goals	4.86	0.345	1
C 2	Determine program deliverables	4.75	0.478	2
C 3	Technical ability	4.14	0.533	28
C 4	Document constraints	4.47	0.634	9
C 5	Document assumptions	4.18	0.599	26
C 6	Define program strategy	4.38	0.624	15
C 7	Quality assurance	4.10	0.782	29
C 8	Identify resources needs	4.30	0.626	22
C 9	Develop a budget	4.62	0.578	5
C 10	Create a WBS	3.85	0.861	34
C 11	Develop a schedule	4.53	0.645	8
C 12	Develop a resource mgt plan	4.02	0.815	31
C 13	Establish program controls	4.44	0.664	11
C 14	Develop program plan	4.37	0.752	18
C 15	Communicate status	4.27	0.638	23
C 16	Measure performance	4.35	0.594	20
C 17	Implement corrective action	4.47	0.553	10
C 18	Implement change control	4.31	0.739	21
C 19	Respond to risk	4.41	0.607	13
C 20	Administrative closure	3.66	0.771	35
C S1	Project leadership	4.65	0.493	4
C S2	Flexibility	4.42	0.549	12
C S3	Business judgment	4.36	0.560	19
C S4	Trustworthiness	4.75	0.452	3
C S5	Communication style	4.21	0.528	25
C S6	Listening skills	4.27	0.567	24
C S7	Set and manage expectations	4.40	0.557	14
C S8	Negotiation	4.38	0.623	17
C S9	Issue and conflict resolution	4.16	0.547	27
C S10	Organizational skills	4.05	0.608	30
C S11	Coaching	4.01	0.712	32
C S12	Facilitation	3.85	0.709	33
C S13	Decision making	4.60	0.533	6
C S14	Problem solving	4.38	0.590	16
C S15	Team building	4.54	0.578	7

Note. C = Technical Skill; CS = Soft Skill

also important since most decisions require the PM to delicately balance program goals and powerful stakeholder interests. Complex program decisions reflect *organizational behavior* factors involving resolution of conflicting program goals, and avoidance of uncertainties that can create program risk (Cyert & March, 1958).

Competency Performance

A similar means analysis was also conducted to allow rank ordering of the data for the second question of whether the government PMs were perceived as meeting the expectations for each of the competencies in the study. Table 2 shows the means ranking of the performance data. Noteworthy (and perhaps a bit disturbing) is that the performance scores *for all competencies* generally rated only near average. This overall result can only be considered surprising and not a little disappointing, given the high stakes and inherent expectations that defense PMs are capable of managing billions of taxpayer dollars and providing critical defense systems to the battlefield. The results seem to indicate that government skills could generally use additional developmental improvement across the entire spectrum of hard and soft skills.

Closer examination of the data nearer the bottom of the performance range reveals items with lower perceived performance, such as the PMs' ability to *implement change control, develop a resource management plan,* or *provide coaching.* In absolute terms, these are important insights to areas where training and development could potentially help improve skills. However, since many of the items have poor survey assessments, it becomes important to weight the findings by importance to be more discerning of the areas where improvements might yield greater value.

Determining the Competency Gap

In order to judge the relative size of the performance gap in PMs' meeting important competencies, the results of the two rankings—importance and performance—were compared and more closely analyzed. The assessment approach for this analysis was based on the Borich weighting model (1980). In this model (Table 3), the difference between the mean assessed ability to meet a competency was compared to the mean perceived importance to measure/identify the magnitude of the discrepancy. This discrepancy score was then multiplied by the competency importance to garner a weighted score.

By using this method, items with the largest gap between importance and performance migrated to the top of the list, reflecting a more finely prioritized list of important competencies with larger shortfalls. For

TABLE 3. COMPETENCY PERFORMANCE DATA

Competency Designation	Competency Description	M	SD	Ranking by Mean
C 1	Determine program goals	3.42	0.911	4
C 2	Determine program deliverables	3.27	1.015	10
C 3	Technical ability	3.45	1.043	2
C 4	Document constraints	2.98	1.029	27
C 5	Document assumptions	2.97	0.958	29
C 6	Define program strategy	3.03	1.032	24
C 7	Quality assurance	3.32	0.816	7
C 8	Identify resources needs	3.04	1.068	23
C 9	Develop a budget	2.90	1.121	31
C 10	Create a WBS	3.05	0.991	21
C 11	Develop a schedule	3.09	1.018	18
C 12	Develop a resource mgt plan	2.86	0.855	34
C 13	Establish program controls	3.00	1.057	25
C 14	Develop program plan	3.13	0.987	14
C 15	Communicate status	3.43	1.050	3
C 16	Measure performance	3.35	0.978	5
C 17	Implement corrective action	3.05	1.042	22
C 18	Implement change control	2.68	1.135	35
C 19	Respond to risk	3.12	0.943	16
C 20	Administrative closure	2.88	1.063	32
C S1	Project leadership	3.30	1.046	8
C S2	Flexibility	3.07	1.075	19
C S3	Business judgment	2.99	1.078	26
C S4	Trustworthiness	3.62	1.160	1
C S5	Communication style	3.22	1.125	11
C S6	Listening skills	3.21	1.029	12
C S7	Set and manage expectations	3.07	0.976	20
C S8	Negotiation	2.93	1.154	30
C S9	Issue and conflict resolution	3.10	1.025	17
C S10	Organizational skills	3.21	0.798	13
C S11	Coaching	2.87	1.046	33
C S12	Facilitation	2.98	0.984	28
C S13	Decision making	3.34	0.987	6
C S14	Problem solving	3.28	0.998	9
C S15	Team building	3.13	1.039	15

Note. C = Technical Skill; CS = Soft Skill

example, using this method, even though *trustworthiness* was rated of high importance, it was deemphasized in the gap analysis because it scored relatively well in the performance assessment. Conversely, the chosen method elevated *negotiation skills* to a higher gap position even though it was rated in the middle range of importance, since it was assessed near the bottom of PM performance.

Table 4 shows the top 10 competency gaps based on the Borich analysis. In this list a surprising number of technical skills topped the list, including *develop a budget, implement change control, document program constraints,* and *determine program deliverables* (Borich, 1980). Of the top 10 items, only two identified shortfalls were soft skills—*negotiation* and *team building*. These results seem contrary to assertions by Bauer (2006) and Golob (2002) that soft skills may be the most important to program

TABLE 4. COMPETENCY SHORTFALLS USING BORICH MODEL (ABRIDGED TO TOP 10)

Competency Designation	Competency	Importance (I)	Performance (P)	Difference I x (I-P)
C 9	Develop a budget	4.616	2.902	7.913
C 2	Determine program deliverables	4.753	3.268	7.060
C 18	Implement change control	4.308	2.676	7.030
C 1	Determine program goals	4.863	3.420	7.016
C 4	Document program constraints	4.466	2.978	6.643
C 11	Develop a schedule	4.527	3.088	6.519
C 13	Establish program controls	4.438	3.000	6.384
C S15	Team building	4.538	3.132	6.378
C S8	Negotiations	4.377	2.927	6.345
C 17	Implement corrective action	4.466	3.051	6.316

success, and the study by Gadeken (2004), which suggested that defense PMs should seek soft-skill training.

Conclusions

The current study appears to be the first in the literature to explore the competencies of Department of Defense program managers from the perspective of their industry counterparts. The data allowed for the ranking of competencies believed to contribute most to program success, as well as assess how well defense PMs met those competencies. From these results, a priority-ordered list was developed of competencies that are candidates for improvement through training and development. The competencies ranking in the top 10 for importance represented a relatively even mix of technical and soft skills, as did the raw rankings of PM performance. However, when analysis was done to discover the variance between competency importance and performance, the results ranked many of the technical skills at the top of the list of candidates for improvement. These findings seem to refute the conventional wisdom and may provide new insights and contributions to the literature.

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