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TIME TO UPDATE OMB CAPITAL PROGRAMMING GUIDANCE

By John D. Driessnack, Olde Stone Consulting, LLC

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Introduction

The U.S. Federal Government has had some stunning successes in technology development, and we benefit from those technologies—such as GPS and flat panel displays—every day. But there is also a long list of failures, as noted in numerous Government Accountability Office (GAO) reports, and continued problems summarized in the GAO High-Risk List. As a loose consortium of small, medium, and large organizations that make up the largest acquisition system in the world, federal agencies need to take a comprehensive look at their collective acquisition policies and processes, including portfolio management, as noted numerous times in the GAO (2015) *High-Risk Series*. The loose consortium approach should be examined with an assessment of whether a more integrated approach with common acquisition management standards could result in a more effective and efficient bureaucracy.

The Trump administration, through the Office of Management and Budget (OMB), has the opportunity to kick off this process by updating OMB Circular A-11 (A-11) and the Capital Programming Guide (CPG) along with related policies as it begins its term in office. The A-11 describes how to prepare, submit, and execute the budget. The CPG provides U.S. Federal Government leaders and acquisition professionals guidance on capital programming, acquisition, and budgeting techniques, and capital asset control. The policy and guidance is issued every summer; therefore, the new administration will have the opportunity to issue updates in the summer of 2017. The CPG and related policy influence the spending of billions of dollars for acquisition and management of capital assets. Updated documents can influence the formation of agency strategic plans, the 2019 and future budgets, and the management of acquiring and maintaining today's federal capital assets. A change in 2017 could positively influence the way capital assets are managed and how current funds in the pipeline are spent.

The CPG has not been revised significantly since it was initially published almost 20 years ago. Since the CPG was issued, individual agencies have evolved agency-specific policies and practices with some standardization, mostly influenced by the Department of Defense (DoD). But more and more the Federal Government is buying industry products—following industry, not leading it, especially in Information Technology (IT). A-11 and the CPG need a complete evaluation and revision to align with industry best practice. Additionally, federal agencies are sharing services, thus there is a need for more standardization of capital asset acquisition and management processes across all federal agencies. The problem is not the Federal Acquisition Regulation, which outlines the procurements. The challenge is with the management of projects, programs, and portfolios.

The new administration should direct OMB to update and expand policy and guidance to improve effectiveness and efficiency in the way a significant portion of the federal budget is spent and how all capital assets within the federal government are managed. The policy and guidance should be updated to incorporate and align with leading standards and best practices. It should be expanded to go beyond the programming implied by the CPG name and lay out a comprehensive management framework. Finally, it should encourage increased effectiveness and efficiency across federal agencies and industry partners through the creation of Cross-Agency Priority (CAP) goals with a cross-agency Performance Improvement Council (PIC) and a Goal Leader in each agency. This approach is already outlined in the federal government strategic planning process in A-11.

The Program Management Improvement and Accountability Act of 2016 (PMIAA), summarized in Figure 1, was signed by President Obama at the end of 2016. OMB Circular A-11 and the CPG are best suited for expanding upon PMIAA requirements and provide a holistic policy approach for program management of capital assets as part of the implementation guidance. This paper proposes to not only accommodate the requirements of the

Program Management Improvement and Accountability Act (PMIAA)
The Program Management Improvement and Accountability Act of 2015 (PMIAA) is designed to enhance accountability and best practices in project and program management throughout the federal government. The law calls for the reformation of federal program management policy in four important ways:

1. Creating a formal job series and career path for program managers in the federal government.
2. Developing a standards-based program management policy across the federal government.
3. Recognizing the essential role of executive sponsorship and engagement by designating a senior executive in federal agencies to be responsible for program management policy and strategy.
4. Sharing knowledge of successful approaches to program management through an interagency council on program management.

Figure 1: Summary of the Program Management Improvement and Accountability Act.

new law, but to go beyond them. As Jack Welch (Tichy & Sherman, 1992) is noted as saying: "Control your own destiny or someone else will" and "Change before you have to."

The Trump administration should make updating and expanding A-11 and the CPG a part of its first 100-day emphasis for maximum impact. A joint federal and industry team should focus on four high-impact areas in the first 100 days:

- Implementing cross-agency priority goal(s) to align with leading standards and form a cross-agency PIC with goal leaders from each agency
- Embracing the multi-tier life cycle framework and governance structure used by most industries
- Linking strategic objectives to portfolio value indicators
- Adopting industry certifications and augmenting them with federal requirements as needed

Within the second 100 days, a broader group of agencies and industry groups could comment and assist in finalizing the initial updated policy and guidance. Agencies would then be required to update their approach to capital asset acquisition and management, given an updated approach, while creating a process improvement effort to continuously improve the overall capital asset policy and guidance.

This is not a one-time change, but a call to treat this as an initial update toward a comprehensive modernization and expansion of capital asset acquisition and management—to take a cross-agency priority goal approach as outlined in the A-11, Part 6. A senior executive within OMB needs to be assigned as the cross-agency Performance Improvement Officer (PIO) who, along with specific goal leaders across federal agencies, forms a cross-agency PIC. The undertaking should not end until a process is established that indicates agency changes are positively impacting outcomes and are sustainable. The goal should be the implementation of a culture of effectiveness and efficiency supported by a continuous improvement process that cuts across all federal agencies.

Understanding History so That Change Can Happen

There is a "plethora of policies and practices" (Driessnack, 2015), which is a natural outcome of the original intent of the CPG to outline key principles. David Muzio, who led the effort to complete the initial CPG, noted that the "guide was not written to provide a complete framework or methodology, but to focus on key principles. We expected the guide to be revised periodically as agencies gained experience and program management principles and practices evolved" (p. 3).

It is now time for the CPG to become more than just key principles. The Capital Programming Cycle, which was renamed a life cycle in version 2 of the CPG, has stayed basically the same since inception and is not utilized as-is by any federal agency. Every agency tailors the life cycle, and most are focused on a project perspective, as shown in Figure 2. But the management of capital assets has become more sophisticated with the development of multi-tier frameworks of portfolios, programs, and projects. The industry standard is for portfolios—which drive the mission—to break down into programs (integrated projects and other activities to deliver long-term benefits), which can be further broken down into projects (temporary efforts that produce specific results) as shown in Figure 3. PMI first published *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*, the standard for project management, in 1996—a year before the CPG was first issued. While these standards are being updated currently to the next edition (The *PMBOK® Guide* is now in its fifth edition and is joined by *The Standard for Program Management* and *The Standard for Portfolio Management*, both of which are now in their third editions), so much has changed—an acknowledgment of the persistent change in global industry and the public sector. These industry standards are consensus-based, following procedures outlined by the American National Standards Institute and contribute guidance for all aspects of organizational project management.

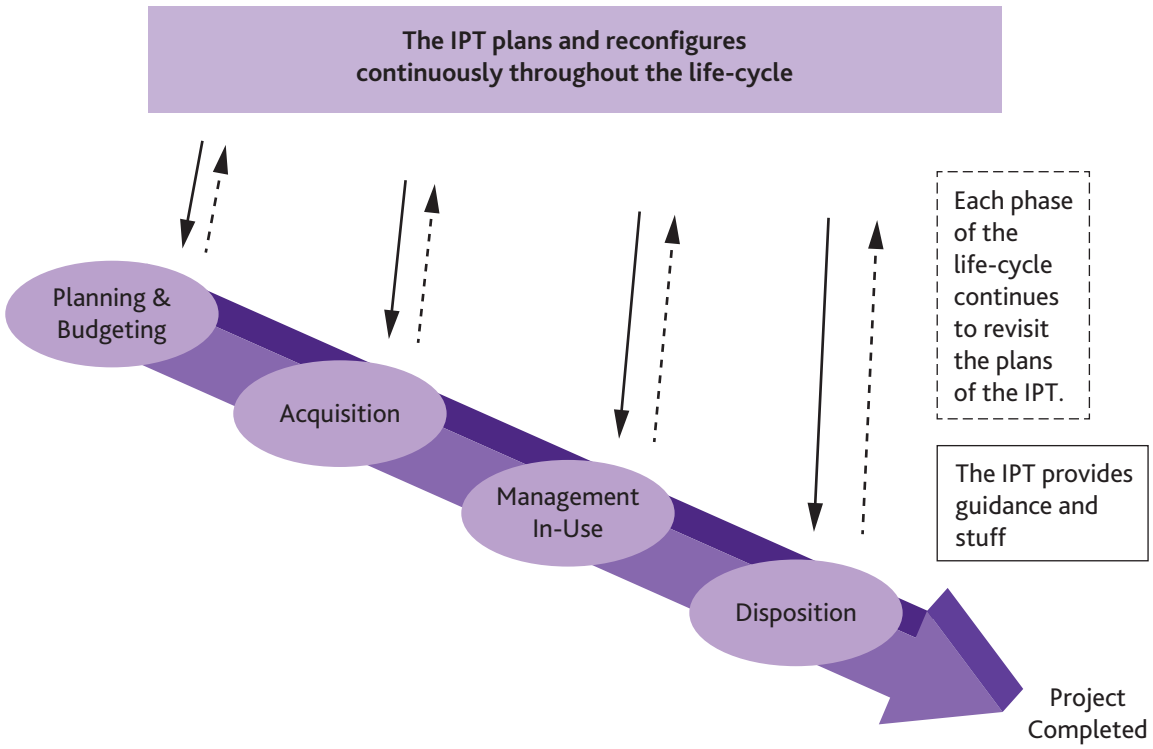

Figure 2: Capital planning life cycle (OMB, 2016b).

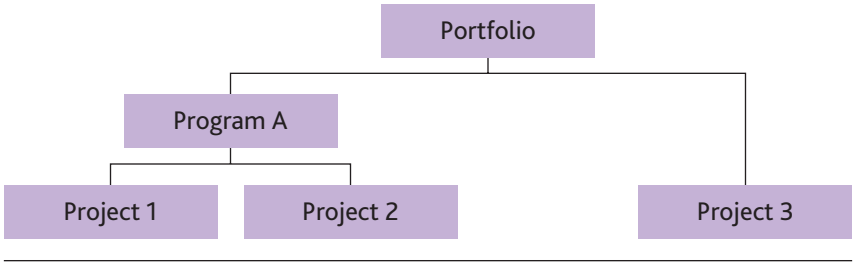

Figure 3: Program and project component relationships in portfolios.

In 2015, the Federal Acquisition Institute published the *Project Management Guidebook*; but it relied heavily on DoD guidance and language, which continues to be complicated and in conflict with industry language. Use of American National Standards instead would not conflict with the current A-11 or the CPG, and there is great benefit in having a "common language and a standard framework for agencies' utilization" (Driessnack, 2015, p. 4). The use of standardized language is growing in both industry and within several federal agencies. Use of leading standards published by PMI, International Council on Systems Engineering (INCOSE), and other industry groups along with GAO best practices, which are based in part on industry input, continues to expand across the executive branch.

It is time for a unified framework to be applied across all federal projects, programs, and portfolios. As noted by Driessnack (2015), the "federal acquisition environment, as outlined in OMB policy and guidance, is not a complete framework. It is a collection of key principles and lessons learned. It has many shortcomings if that is all that is followed" (p. 4). As the federal agencies continue to work in cross-agency efforts, it is becoming more important than ever to have a common framework and language.

One could look at the update to A-11 and CPG as a reform, and over the past 60 years there have been many attempts to reform federal acquisition. Attempted reforms started in the late 1960s and early 1970s and have essentially continued through to today with hundreds of studies completed producing numerous reforms, most of which have been focused on defense acquisition. The words "update" and "expand" are being used to make a distinction that this is not a call to reform the current policy and guidance, but to update and expand by embracing leading standards and best practices. It is also to recognize the economics in the industry. As noted by Driessnack and King (2004), in the past "contractors specialized not only on a particular weapon system, but also on the unique procurement organization within each armed service" (p. 68). A "single process initiative did not eliminate the unique requirements of the government, but reduced the ability of the different DoD agencies and services to require unique processes" (p. 68). This consolidation, along with what Scherer (1964) noted as the essential economic problem in the weapons acquisition process when compared to industry, is that "the government's problem of maintaining incentives for efficient and optimal program execution in this essentially nonmarket environment" created a unique DoD weapons market. It is this nonmarket environment upon which the DoD unique processes have focused. Only the government buys weapon systems—in fact, it must create them from conception to disposal. But, these complex processes are not needed when the DoD and the federal government are buying from the market. One needs to consider an approach that tailors federal policy and guidance for the nonmarket environment when it exists; that is, having to tailor it out. What is needed is a standardized approach that takes a lean view and uses industry best practices as the base, and then tailoring in the complex processes.

Many agencies have realized the need to migrate away from DoD influence and have written their own policies and guidance. This has led to what was common in the 1960s, 1970s, and early 1980s within the DoD services—unique policies for each department with very little cross-pollination. In 1971, under the leadership of David Packard, DoD 5000.01 *Directive* was issued, which started to consolidate DoD acquisition policy. The DoD 5000.02 *Instruction* document was subsequently issued in 1975. The consolidation of Federal Acquisition Regulation came in 1984. These together helped to consolidate the DoD capital asset management among the weapon systems across the various services, which helped lead to more joint programs and common approaches and training at the Defense Acquisition University. It is time for OMB to lead the federal agencies to a similar common policy and guidance with a more "market" view of products, which will lead to more joint program and common solutions across federal agencies.

Update and Expand Federal Policy and Guidance

The following four recommended updates and expansions are not the only improvements needed, nor are they the solution for accountability within federal capital asset management. They can be a starting point for a new era of process improvement similar to the consolidation of federal acquisition regulations that came about in the 1970s and early 1980s. They are also essential for moving beyond simply implementing PMIAA. They are the jumping-off point for achieving a holistic improvement of capital asset management and accountability.

Implement a Cross-Agency Priority (CAP) Goal

The CPG is generally structured around guidance for acquisition and management of a single capital asset. The emphasis on projects was added beginning with version 2 with the statement that it is "a disciplined capital programming process that addresses project prioritization" (OMB, 2016b, p. 1). This drove the development of the capital asset life cycle shown in Figure 2, which also serves as the structure of the CPG. The CPG requires agencies to create a "formal capital asset management infrastructure [with an executive review committee] reviewing the agency's entire capital asset portfolio" (p. 2). But limited guidance is provided on how such an infrastructure or committee should operate. This top-level guidance is for more than just programming, but it is too limited to drive any standardization across agencies and thus any common process improvement. Further guidance on management structure is needed to enable standardization across federal agencies and to implement common measures that can drive improvements.

It is time to change the guide from a focus on "programming," which is an early stage of the budgeting function, to a focus that covers the whole capital "systems management" process. It should continue to limit prescription and allow individual agencies to tailor to their specific needs. It should offer a more robust management framework and drive for a common language and similar framework across federal agencies. As it moves from a focus on programming to management, it needs to view a formal capital asset management infrastructure that starts with the strategic planning process.

The strategic planning process within the agencies is focused on the agencies *PROGRAM(s)*, which this paper distinguishes from program(s) as shown in Figure 4. The performance management cycle depicted in A-11 strategic planning guidance discusses how these PROGRAMS perform. This is often confused with what the CPG calls a program, the definition of which is similar to the published standards' definition.

The section of the CPG titled, "Strategic and Program Performance Linkage" discusses the linkage to the agencies' strategic plan and the enterprise architecture. It talks about the link to the PROGRAM, but doesn't give specific guidance. How does one move from the PROGRAM-level performance indicators called for in Part 6 of A-11 to the project or program level, or even the portfolio level? It is not clear in the CPG how these linkages are made nor how the performance should be managed. PMIAA requires agencies to "not less than annually, conduct portfolio reviews of agency programs in coordination with Project Management Improvement Officers . . . to assess the quality and effectiveness of program management." Building a framework aligned to industry standards, where the portfolio is the link between strategy and the programs and projects to realize that strategy (as depicted in Figure 5), would go a long way toward enabling the consolidated view and review of the agency portfolio.

PROGRAM or Program
All capital letters are used in this paper to denote the PROGRAMS that are the major missions of the agency, such as the Social Security PROGRAM, Federal Student Aid PROGRAM, or the Thrift Savings PROGRAM.

The CPG (2016b) defines program and project similar to industry standards:

- A program is, "an ongoing initiative composed of a group of projects and other work managed in a coordinated way to obtain benefits not obtained from managing them individually" (p. 84).
- A project is, "a temporary endeavor to create a unique product or service with a start date, a completion date, and a defined scope" (p. 84).

Figure 4: Two ways in which the term "program" is used.

The 79-page supplemental IT budget guidance document based on A-11 Section 55 does a much better job of linking the PROGRAM strategic performance with IT portfolios and their required business cases by pulling the specific agency functional/business sponsor into the process. But much of the guidance is on reporting and budgeting and not management. The non-IT instructions are 12 pages and are mostly focused on reporting requirements. These supplemental documents should be combined and folded back into the new management guidance with more than just an emphasis on reporting. Industry standards connect strategy to projects with appropriate performance measurements starting at the portfolio level.

In this same strategic section, the CPG discusses the Integrated Project Team (IPT) concept. The CPG gives the impression that there is just a single IPT for each project, but this is not really the case. Many IPTs are formed under various management structures. In some agencies there are integrating teams for cross-project efforts within programs and systems teams that are working at the portfolio or program level. Large and small agencies are already taking portfolio, program, and project approaches using the DoD-developed Integrated Product and Process Development approach. For instance, the Department of Homeland Security's Customs and Border Protection (CBP) reorganized its capital asset efforts in the third quarter of 2016 into four portfolios with

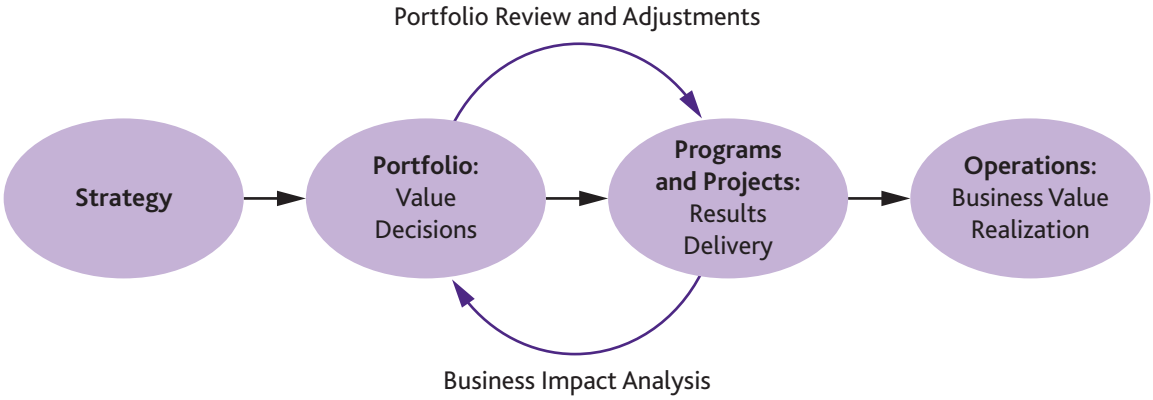

Figure 5: Organizational project management framework (PMI, 2013a, p. 18).

assignment of four Portfolio Acquisition Executives under the agency's Component Acquisition Executive. Several years back, the FAA also consolidated its "portfolio" of programs and projects into a combined management office abandoning the previous organizational structure, which was broken out by three mission areas. This consolidation, in some ways, is the opposite of the CBP reorganization of breaking out into mission areas. The Federal Retirement Thrift Investment Board noted in its April 2016 board minutes that its integrated strategic planning and performance management framework, or Enterprise Planning Process, helped prioritize planning into portfolios that are linked to its 2017–2021 strategic plan.

Portfolio structures are being deployed, but have not yet been standardized across the consortium of acquisition organizations. The federal consortium should standardize portfolio strategy documents, road maps, and performance measures that follow industry standards whether they are mission-, product-, or strategic initiative-oriented. Portfolio management helps link the programs and projects to agency mission, and provides a clear linkage from strategic plans through to the project deliverables. It also provides a governance structure with portfolio managers above program/project management. With portfolio leadership, linkages to agency missions can be actively managed and could help reduce the length of the GAO High Risk List. Agency management should start measurement at the strategic level, and link to the portfolio, then to programs and projects.

OMB could decide that agencies know best how to tailor their frameworks and management approaches and not intrude on such efforts. The problem with this approach is the increase in cross-agency work, especially in information technology and procurement vehicles. The federal government portfolio, program, and project managers, along with their industry counterparts, do not have a standard framework from which to work. This flows down to many specific knowledge areas. As industry works across agencies, the level of maturity in management processes and agency expectations are broad, driving some vendors to be specialists in each agency. This reduces the mobility of staff and limits competition among vendors. Training for federal employees is either not tailored to an agency-unique approach or is tailored at an increased cost to the agency. The lack of standard management guidance will continue to inhibit efficiencies and process improvement across the federal government.

Today's thin guidance from OMB has consequences. Each agency evolving its own guidance is not improving the overall effectiveness nor efficiency of the practices, but rather making it more complicated for industry to work across many agencies and with federal acquisition employees who move between agencies. Most agencies do not need their own set of guidance as DoD has developed. In fact, historically, the military services had their own policy and guidance, which has been substantially consolidated. In the past 20 years, industry groups have developed well-documented management and technical practices, and OMB should not only adopt, but exploit these practices and develop a common federal approach.

In the public sector, many organizations create a center of excellence (CoE) that houses deep expertise in the various aspects of project management. These CoEs assist the organization in maturing practice in project management, and also serve as resources to the rest of the organization by consolidating the expertise in one central location. Selected federal agencies, such as NASA for risk management or the FAA for earned value management, can be excellent sources of information in all knowledge areas and could be the centers of excellence (CoE) for those knowledge areas across federal agencies. There can be multiple CoEs with one for each knowledge area. There could also be a CoE focused on larger, more complex projects while another CoE focuses on more commercially oriented service contracts. There is no need for each agency to have its own CoE across all project management topics. The CoE could have revolving staff from various agencies to help institutionalize the flow of best practices across agencies.

As the OMB undertakes these updates, it should ask industry for assistance similar to the way in which GAO has done with its cost and schedule best practices guides. This approach would also simplify compliance with PMIAA and its requirement to use industry standards as noted in Figure 1. Similarly, industry can provide valuable knowledge and expertise to strengthen government capabilities. For example, PMI and INCOSE have already demonstrated that they can be valuable partners in joint guide development. In 2012, the joint MIT-PMI-INCOSE consortium published the award-winning *The Guide to Lean Enablers for Managing Engineering Programs* (Oehmen, 2012). The lean enablers in that guide have application beyond engineering programs and, as appropriate, should make it into the federal guidance as an example of an industry document that federal agencies embrace as best practice.

There is no need to copy PMI, INCOSE, or other industry guidance into A-11 or specific agency policies and guidance. These published standards and guides may simply be referenced as foundational guidance and considerations to be used for adaptation. Supplementing best practices and clarifying agency implementation approaches should be the approach similar to what some agencies have done with the GAO best practices guides. What is needed is for A-11 Appendix J, *Principles of Budgeting for Capital Asset Acquisitions* (where the CPG is called out as a supplement to A-11), and Appendix K, *Selected OMB Guidance and Other References Regarding Capital Assets* (where the CPG is again called out as supplemental guidance along with the GAO best practices guides), be combined and expanded as a Part 7 of A-11 (moving the appendices to a Part 8).

A-11 should simply reference the leading standards called for in PMIAA. A selected number of key principles in the CPG today should be moved into the policy, such as the executive review process and certification requirements for professional staff. There is no need for the expanded Part 7 to be the equivalent to DoD *Directive* 5000.01 and DoD *Instruction* 5000.02, but a baseline set of policies and instruction should be established that all federal agencies, including DoD, follow. This will enable both civil and defense agencies to develop their own policies (directives and instructions) and guidance in a manner that is supplemental and not duplicative.

A-11 Appendices J and K would be updated with expanded linkages to A-11 Part 6 on strategic planning. Because civilian agencies buy more non-differentiated products than DoD, the federal policy and guidance should take a criteria approach, similar to earned value management, that emphasizes implementing industry standards for knowledge, processes, and frameworks, while allowing tailoring to the unique needs of the particular agency's portfolio(s), program(s), or project(s).

This is a lot to accomplish, thus the need for the implementation of a cross-agency priority goal for formation of agency centers of excellence that can attack the challenges. Within the first 100 days, a selection process can be completed, identifying which agencies will attack which part of the update. A large and small agency approach can be taken with a process set up for cross-collaboration. Maybe the various agency acquisition school houses, such a NASA Academy of Program/Project & Engineering Leadership, DoD Defense Acquisition University, VA Acquisition Academy, IRS Treasury Acquisition Institute, etc., could take on various knowledge areas. The concept is to divide and conquer under a common cross-agency priority goal of updating the policy and guidance in the shortest time possible.

Move to a Multi-Tier Life Cycle Framework with Stronger Governance

The move from a single-tiered life cycle framework to a multi-tier life cycle framework that begins with the strategic plan and flows down through a portfolio to programs and projects is central to the A-11 and CPG update. Today, the CPG and most agencies have a single-tier life cycle that is focused on the specific program or project. Portfolio reviews are happening as one-offs called for in particular policy letters or unique policies, such as DoD *Defense Acquisition of Services* policy (DoD 5000.74) or federal IT business case requirements.

Portfolios need to be recognized and managed by qualified portfolio managers with specific performance measures linked to the agency's strategy and objectives.

Along with the multi-tier life cycle framework, it's essential to clean up the governance model by separating the Senior Procurement Executive and oversight for the agency's Federal Acquisition Regulations from the Chief Acquisition Office (CAO). The CAO should play the role of agency Program Management Improvement Officer as outlined in PMIAA. Additionally, the CAO role needs to be the primary duty for those assigned in most agencies, even small ones. (See GAO 12-792 for numerous reporting challenges with the current implementation of the Service Acquisition Reform Act of 2003.)

Why is multi-tier a best practice? First, the vertical tier allows for a flow of requirements that is linked to the agency's strategic plan. Second, a clear, tiered framework clarifies the governance structure. In large organizations, as most federal agencies are, there are multiple layers of management on the way down to a project manager working to deliver a particular service or capital asset, whether that be an upgrade to the servers or a reorganization of needs into a new service contract. Thousands of projects are run within the federal agencies each year, some taking many years and costing billions of dollars. However, many agencies do not have a clear path for governance and oversight of these projects.

The governance structure should follow this multi-tiered framework with agencies selecting an appropriately lean, tailored, gate-review process for each tier with a different focus at each tier. OMB policy calls for an executive review process, but provides little guidance or criteria for the process. Industry utilizes an organizational project management framework as a structure that not only clarifies the relational structure between strategy/mission and individual programs and projects, but also provides a useful framework for governance oversight. Organizational project management connects strategy/mission to execution through the portfolio with a focus on value realization, as depicted in Figure 5. Programs, which contain interrelated projects and operational work, are created to realize benefits that drive value creation. Projects, either as part of a program or as discrete initiatives, then focus on delivering capabilities or outputs while controlling for cost, schedule, and scope. The executive review process for many agencies approves an agency's strategic plan and can be the same process that approves the portfolio structure and strategies, including the road map for implementation. The programming and budget process could also follow the tiered process with the portfolio as the major funding category allowing for funding pools that can be allocated to programs and projects as a risk mitigation resource.

The creation of the Chief Acquisition Officer's role, per GAO-12-792, is to assure agencies are meeting OMB's and GAO's definition of best practices and leading practices in acquisition management. But GAO has found that this is not happening. The GAO-12-792 (GAO, 2012) report states:

> *CAOs see their role as providing high-level oversight of the acquisition function as opposed to day-to-day management, which they typically delegated to the Senior Procurement Executive or other officials as permitted by the legislation. Many CAOs said that the amount of their involvement is related to several factors, such as the nature of goods and services that the agency buys and whether the agency has a centralized or decentralized acquisition function.*

> *Having clearly defined roles and responsibilities of stakeholders in the acquisition process is a key element of an effective acquisition function. Yet at many agencies, the statutory roles and responsibilities of the CAO position are not described in detail in acquisition regulations, policies, or other documentation.*

The Obama administration agreed with the GAO findings and issued an OMB memo dated 18 October 2012 titled *Clarifying CAO Roles and Responsibilities*, which had an attachment clarifying the statutory responsibilities. Key within those requirements is monitoring the performance of acquisition programs and developing and maintaining an acquisition career management program, which includes project and program management in the Federal Acquisition Certification process. However, there is not a common approach across agencies to benchmark and assess how the CAOs are doing. The fractured approach is most likely neither effective nor efficient for the government as a whole. It is unknown because it is not measured, especially across agencies.

The problem with not having a common approach across agencies is the lack of ability to benchmark and assess how the CAO is doing. By comparison, the Canadian government has an organizational capacity assessment that matches up with a project complexity and risk assessment. An agency's capacity has to be able to handle the project's complexity and risk to be relieved of various oversight requirements. GAO and OMB have an assessment tool that is outlined in Figure 6. But, the tool is not used consistently, does not address core program and project management activities, and does not evaluate portfolio management functions at all. The cornerstones, elements, and critical success factors outlined do not mention projects, programs, nor portfolios, and generally do not address the knowledge areas and processes called out in industry standards. The focus is on the unique requirements in the federal agencies. PMI has the *Organizational Project Management Maturity Model* (*OPM3®*), which despite only having project in its title, "is a strategy execution framework that utilizes portfolio, program, and project management as well as organizational-enabling practices to consistently and predictably deliver organizational strategy" (PMI, 2013a, p. 3). Industry assessment frameworks, such as *OPM3* outlined in Figure 7, should be considered as a baseline and supplemented with the unique federal assessment tools to form a comprehensive assessment.

Another challenge the multi-tier framework helps address is the long-term management of the unique systems. Not all portfolios of assets need to be managed as systems in which all assets are under management by a set of systems managers the way they are in the DoD. The systems management concept is explained in INCOSE's *Guide to the Systems Engineering Body of Knowledge (SEBoK)* (BKCASE Editorial Board, 2016), which recognizes the difference between project/systems management, systems engineering, and systems implementation, as depicted in Figure 8. These are advanced topics relative to structuring agency portfolios, but they are key in understanding how the capital assets are going to be managed within the system and how they are measured. This is important for agencies that are buying more than services and commercial products and need engineered systems. Most agencies do not need the extensive processes in DoD, but they do have financial and information systems that pull various commercial products together for the agency's unique mission. The interface between systems engineering, systems management, and systems implementation is often very muddy within federal agencies, which confuses requirements, funding, and overall governance and performance metrics.

The Guide to Lean Enablers for Managing Engineering Programs (Oehmen, 2012) notes the top ten themes or challenges in managing engineering programs. Several are related to organizational structures and governance, such as:

- *Theme 3: Insufficient Alignment and Coordination of the Extended Enterprise*, which defines the need for "alignment and optimization of strategic priorities and portfolios" (p. 29)
- *Theme 4: Locally Optimized Processes that are not Integrated Across the Entire Enterprise*, which identifies "a lack of visibility for the value stream, and/or barriers between organizational units to implement a seamless flow" (p. 30)
- *Theme 5: Unclear Roles, Responsibilities, and Accountability*, which calls out "misaligned incentives for collaboration between staff, project team, suppliers, customers, or other stakeholders" (p. 30)

These were noted as being key challenges and can be partly resolved by clear structures and governance.

CORNERSTONES	ELEMENTS	CRITICAL SUCCESS FACTORS
I. Organizational Alignment and Leadership (pg. 7)	A. Aligning Acquisition with Agency Mission and Needs (pg. 7)	1. Assuring Appropriate Placement of the Acquisition Function (pg. 7) 2. Organizing the Acquisition Function to Operate Strategically (pg. 8) 3. Clearly Defining and Integrating Roles and Responsibilities (pg. 9)
	B. Commitment from Leadership (pg. 10)	1. Clear, Strong and Ethical Executive Leadership (pg. 10) 2. Effective Communications and Continuous Improvement (pg. 12)
II. Policies and Processes (pg. 14)	A. Planning Strategically (pg. 14)	1. Partnering with Internal Organizations (pg. 14) 2. Assessing Internal Requirements and the Impact of External Events (pg. 15)
	B. Effectively Managing the Acquisition Process (pg. 17)	1. Empowering of Cross-Functional Teams (pg. 17) 2. Managing and Engaging Suppliers (pg. 18) 3. Monitoring and Providing Oversight to Achieve Desired Outcomes (pg. 20) 4. Enabling Financial Accountability (pg. 21)
	C. Promoting Successful Outcomes of Major Projects (pg. 23)	1. Using Sound Capital Investment Strategies (pg. 23) a. Integrating Organizational Goals into the Capital Decision-making Process (pg. 23) b. Evaluating and Selecting Capital Assets Using an Investment Approach (pg. 25) c. Balancing Budgetary Control and Managerial Flexibility (pg. 26) 2. Employing Knowledge-Based Acquisition Approaches (pg. 26)
III. Human Capital (pg. 28)	A. Valuing and Investing in the Acquisition Workforce (pg. 28)	1. Commitment to Human Capital Management (pg. 28) 2. Role of the Human Capital Function (pg. 29)
	B. Strategic Human Capital Planning (pg. 29)	1. Integration and Alignment (pg. 29) 2. Data-Driven Human Capital Decisions (pg. 30)
	C. Acquiring, Developing, and Retaining Talent (pg. 32)	1. Targeted Investments in People (pg. 32) 2. Human Capital Approaches Tailored to Meet Organizational Needs (pg. 33)
	D. Creating Results-Oriented Organizational Cultures (pg. 33)	1. Empowerment and Inclusiveness (pg. 33) 2. Unit and Individual Performance Linked to Organizational Goals (pg. 34)
IV. Information Management & Stewardship (pg. 35)	A. Identifying Data and Technology that Support Acquisition Management Decisions (pg. 35)	1. Tracking Acquisition Data (pg. 35) 2. Translating Financial Data into Meaningful Formats (pg. 36) 3. Analyzing Goods and Services Spending (pg. 37)
	B. Safeguarding the Integrity of Operations and Data (pg. 38)	1. Ensuring Effective General and Application Controls (pg. 38) 2. Data Stewardship (pg. 38)

Figure 6: Chief acquisition officer assessment tool (OMB, 2008, p. 6).

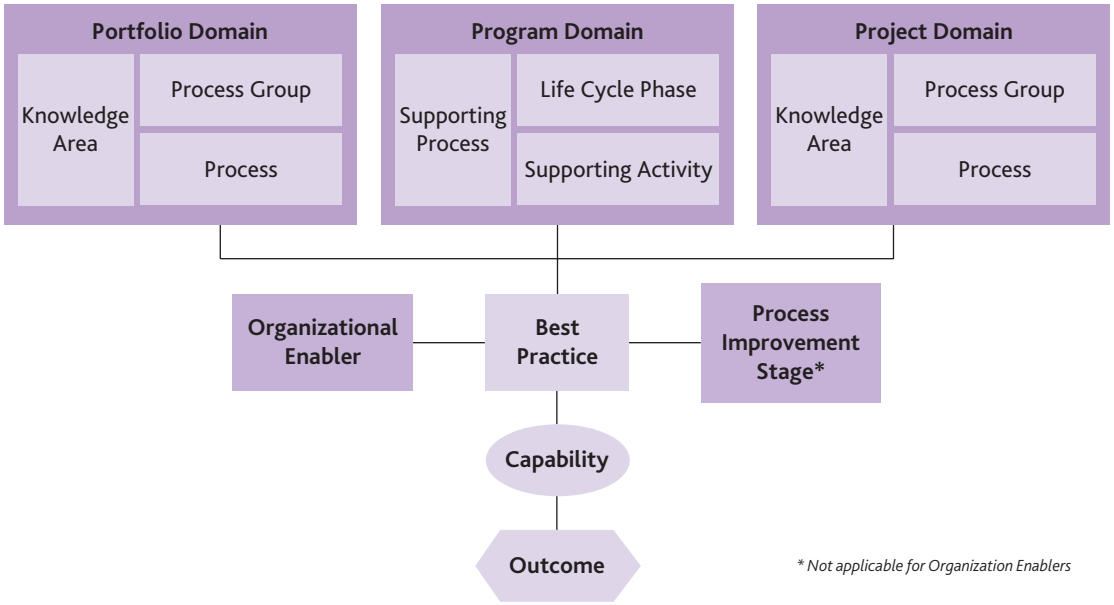

Figure 7: Organizational project management maturity model construct (PMI, 2013a, p. 28).

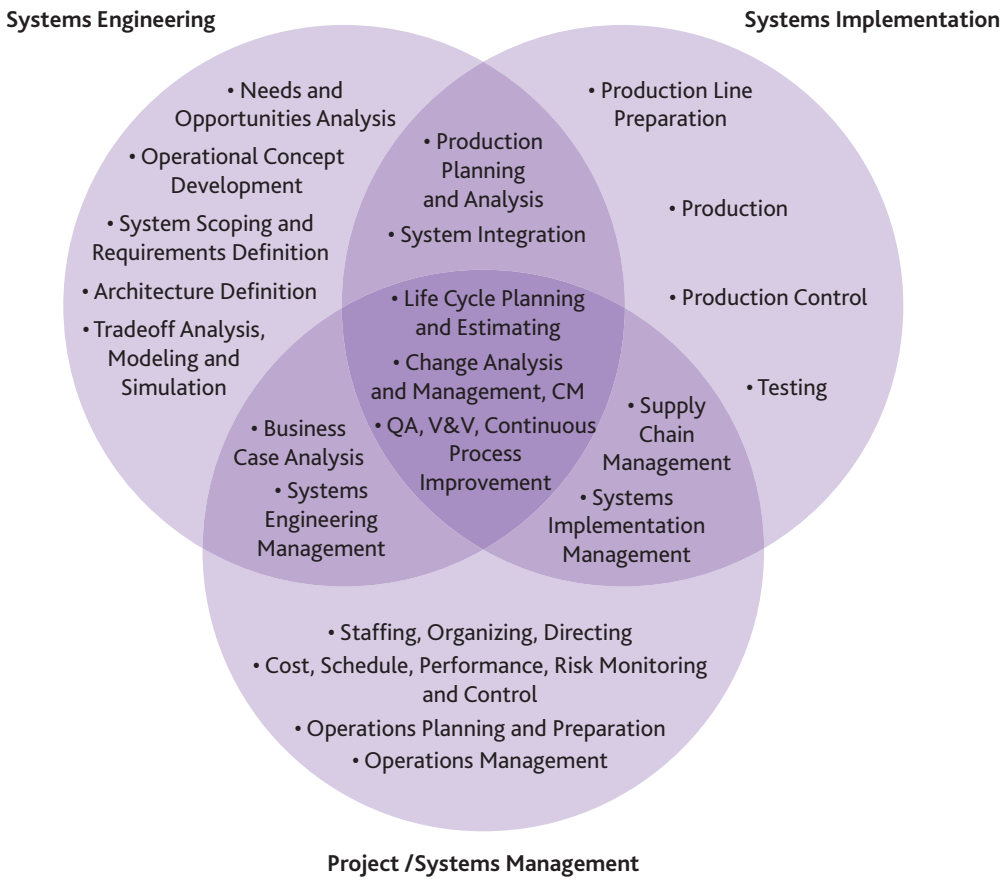

Figure 8: The difference between project/systems management, systems engineering, and systems implementation (BKCASE Editorial Board, 2016). This material is used under a Creative Commons Attribution-NonCommercial ShareAlike 3.0 Unported License from The Trustees of the Stevens Institute of Technology.

There is no one answer for how agencies should build their multi-tiered structure, but there is clear evidence that a single tier is no longer appropriate. Governance and performance reviews need to follow the structure for clearer accountability. Without recognizing the multi-tiered structure and the impact on governance, budgeting, performance measures, stakeholder management, requirements, etc., there is little hope of connecting strategy to projects.

Link Strategic Objectives to Portfolio Value Indicators

The agency strategic plan should identify the portfolio structures that are then linked to specific agency objectives. The directive should call for each agency's Program Management Improvement Officer to create linkage from the agency strategic goal to the agency's portfolios, programs, and projects.

PMIAA calls for the OMB Deputy Director for Management to "conduct portfolio reviews to address programs identified as high risk by the Government Accountability Office." This is a great concept, but how can this be done if the agencies have not defined and aligned their programs and projects into portfolios? Many structures and governance models may be used, but they need to be aligned with the agency strategy. Under the current arrangement, it is often very hard to understand who the decision maker is for a particular program or project, especially as efforts transition from one life cycle phase to the next. The emphasis is often on the planning, budgeting, and acquisition phases, but the Management in Use is often where most of the expense resides, and it is where the planning happens for the next evolution of the system. The intent is to determine if value is being realized, but how does the agency know if performance indicators are not linked to the portfolios and strategic goals?

There is no specific linkage description in A-11 from the strategic performance to the capital asset project. The annual performance measure at the PROGRAM level is not linked to the specific value realized through a particular project's successful completion. The project success is judged on whether or not it stayed within cost, schedule, and technical performance, but not if, in the end, the change implemented is obtaining or realizing the results expected as outlined in the business case or outlined in the strategic objective and performance measure. Cost performance index is tracked under the earned value concept with individual contract performance (and sometimes at the project level), but there is not a performance index at the program or portfolio level. What is needed is a set of benefits and value performance measures/indexes. Across the federal government there is a lack of performance indicators at the portfolio level—the measurement of which should be focused on delivery of the value envisioned in the strategic plan.

PMI standards outline a focus on value at the portfolio level; benefits delivery at the program level; and product or service delivery at the project level. PMI's *The Standard for Portfolio Management* (PMI, 2013b) includes portfolio performance management, and this approach needs to be adopted within the portfolio review process. The IT community has published supplemental guidance, but it only applies to IT projects. Typically, IT is just one part of the change needed to improve the performance in a PROGRAM mission. What should be driving the IT project is an overall business need that is at the program or portfolio level and is linked to a strategic objective that has specific performance criteria. The A-11 focus on IT component development and delivery has been a great start, but it fails to encompass the systems view. The enterprise as outlined in the enterprise architecture, which has a strategic and business layer, needs to be the focus.

With the transition to the new administration, most federal agencies will be updating their strategic plans. Direction needs to be provided in A-11 Part 6 on how those strategic plans' goals and objectives will be linked to the agency's portfolios. The next budget submittals could then map individual program and project funding to portfolios that are linked to the agencies' objectives. Performance reviews with portfolio managers could then

be conducted, which should be a summary of the project and program reviews. But this can only be done well with a common understanding of the multi-tier framework and projects and programs directly linked to strategy using a portfolio view.

Adopt Industry Certifications and Augment with Federal Requirements

Military services have had program-related certification policies for the workforce since the 1970s, along with the Defense Systems Management College, which eventually expanded into the Defense Acquisition University. The Defense Acquisition Workforce Improvement Act (DAWIA) became law in 1990 and standardized acquisition requirements across the military services. Federal agencies were required to do the same thing beginning in 2007 with the Federal Acquisition Certification through the Federal Acquisition Institute. By the middle of 2017, these training/certification efforts in the federal agencies will be celebrating their 10-year anniversary. It is time to review and evaluate the effort and results achieved across the entire system.

Several federal agencies have expanded certifications to include many of the DAWIA functional areas. The time has come for expanded federal management guidance relative to the FAC and DAWIA. OMB doesn't need to be limited to just meeting the requirements of the law and should go beyond it and align with the multi-tier framework called for in this paper. The concept could be project managers at level 1, program managers at level 2, and portfolio managers at level 3. The current FAC structure, which uses the same knowledge base for all three levels, as listed in Figure 9, is inadequate and doesn't cover all industry-standard knowledge areas or processes and practices. The competency models, both the CORE and the Information Technology Core-Plus, do not address portfolio management competencies at all. Today, many level 3 program managers in the DoD and other large federal agencies are probably functioning at the portfolio level, but do not have much exposure to portfolio management concepts.

FAC P/PM Competency Model (Ver 2.1, 26 Sept 2013)

- Requirements Development and Management Processes
- Systems Engineering
- Test and Evaluation
- Life Cycle Logistics
- Contracting
- Business, Cost, and Financial Management
- Leadership

Figure 9: The seven components of the FAC P/PM competency model.

The FAC/DAWIA certificate programs should leverage industry certifications and supplement the certifications with the unique federal/DoD knowledge areas as needed. INCOSE has extensive certification programs for systems engineers; PMI has extensive certifications for project, program, and portfolio managers, as well as specialty certifications in risk, scheduling, agile, etc. Other groups have certifications for related areas of specialization, such as the International Cost Estimating and Analysis Association's (ICEAA) Certified Cost Estimator/Analyst (CCEA®). If FAC and DAWIA concentrate on unique federal and DoD requirements and leverage industry certifications, a better synergy can be created between the federal government and industry. As currently implemented, the FAC/DAWIA certification programs focus on the unique government needs, but do not incorporate key project, program, or portfolio knowledge areas.

The FAC certificate is not based on any federal standard. A-11 and CPG do not provide a comprehensive standard, while agency standards and guidance are not consistent. GAO recognized the problem and developed standardized federal cost, schedule, and other guidance in light of the fact that standardized guidance was lacking in the executive branch. GAO's *Cost Estimating and Assessment Guide* (GAO-09-3SP) has become the cross-agency standard and common thread in most education courses on cost estimating. These GAO guides were written with both federal and industry participation. This guidance helps bring consistency to federal requirements and fill the gaps in federal certification requirements.

The reality is, federal agencies often need teams that have similar capabilities as DoD programs, and the federal process needs to be expanded beyond project managers, contracting officers, and Contract Officer Representatives. Teams on IT programs should have appropriate industry IT certifications; cost and scheduling focused staff should have appropriate industry certifications; and project, program, and portfolio managers should have PMI (or similar) certifications. Today, only the project or program managers and contracting officers need to be certified under the FAC program with the governance/oversight (think portfolio management) coming from leadership that often has limited to no training or experience in capital asset management.

The improved professionalism should not stop with the federal staff, but be expanded to the contracted support staff as well. The expanded FAC/DAWIA programs should include an ability for industry to be qualified with the same or similar certifications. Today, since the FAC project/program manager is totally unique to the federal government, industry partners are not equivalently certified. Taking a standard industry approach with a federal supplement would allow the entire team to be working from similar baselines on the core knowledge areas.

No improvement of the process is going to be complete without a review of the FAC/DAWIA certifications. Federal and DoD programs should be managed within portfolios, and those portfolios need to have trained leadership. Government needs the infusion of experienced industry experts, thus the use of non-government certifications increases opportunities to attract talent from industry. Internal certification makes it difficult for an experienced project or program manager to come into government if they have to start over on certifications for the sake of checking a box and the recognition of a long list of synonyms (semantics) in the unique federal lexicon/vernacular.

Updating and Expanding Guidance Beyond PMIAA Implementation

The Trump administration must not only implement the PMIAA legislation, but take a comprehensive approach with a plan to go above and beyond the minimum legal requirements. The management of capital assets within the federal agencies needs to be compared with industry and updated and expanded. The four areas outlined in this paper are just the start. What is important is that the administration take on the initial goals, which are to:

- Deploy new policy in the summer 2017 issue of A-11 with a new part 7 on Capital Management and a new Capital Management Guide. Pull in the key industry groups and the GAO to build the new Capital Management Policy and Guide as a collaborative effort. This work should be done as a CAP goal.
- Address portfolio management as well as program and project management. Pay attention to the award-winning publication, *The Guide to Lean Enablers for Managing Engineering Programs*, and take advantage of the lean enablers to avoid just adding bureaucracy and instead focus on value-added processes. The goal is to set a baseline that agencies can tailor to meet needs rather than having to tailor out unnecessary bureaucracy.
- Move to a multi-tier life cycle framework that starts with the strategic plan, thus updating A-11 Part 6. Agencies update strategic plans with each new administration, so it is critical to distribute the guidance so that the new strategic plans for each agency are affected. Clean up the governance guidance, integrate the PMIAA agency Program Management Improvement Officer with the CAO, and measure and evaluate agencies on how they are improving their ability to meet GAO/OMB 11 Acquisition Assessment areas, as well as PMI's *OPM3* maturity model.
- Require agencies to define and report their portfolio structure linkage to the updated agency strategic plan and budget as part of the FY19 budget process. Each agency's strategic plan needs to address the portfolios to be managed. The agency heads need to outline their revised organization's structure and governance model for its portfolio of work based on the new policy and guidance.
- Finally, update and expand Federal Acquisition Certification for Project and Program Management so that it aligns with the multi-tier life cycle and addresses more than just Contract Officer Representatives, project and program managers, and contracting officers. The acquisition workforce is federal and industry, so set up a program that both can utilize.

The first 100 days have already started and will go quickly for the new administration. Without a specific dedicated effort, the opportunities will be lost for setting a new tone and kicking off a new era in federal acquisition that tightens the consortium into a more reliable organization with updated and expanded policy and guidance in OMB Circular A-11 and Capital Programming Guide. An update early in the administration, implemented in mid-2017, could immediately influence the way capital assets are managed and how current funds in the pipeline are spent. The clarity created within a multi-tiered governance structure that links strategy to projects and programs with improved performance measures and accountability will have a lasting impact on the effectiveness and efficiency of the federal government. It is time to make the federal acquisition process reflect industry best practice and start down the path to becoming a tighter consortium.

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Project Management Institute
Global Operations Center
14 Campus Blvd
Newtown Square, PA 19073-3299 USA
Tel: +1 610 356 4600

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