

Using **PMI Standards Framework**
to Improve U.S. Federal Government
Capital Investment Outcomes

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Introduction

The U.S. Government Accountability Office (GAO) news articles and reports continue to highlight problems with federal agencies' acquisition of new systems or modification of existing systems. Often, in response to these reports, the U.S. Congress fine-tunes existing laws, the Office of Management and Budget (OMB) revises policies and puts an emphasis on specific approaches, and individual federal agencies rewrite policies and procedures. Repeatedly, one hears that current laws and policies are inhibiting the ability of federal agencies to deliver project value relative to new or modified systems. An outsider looking in might further comment that the environment is complicated by the various policies and procedures across federal agencies and even within the agencies' components. Many agencies adopt portions of the Department of Defense Capital Investment Policies and Procedures, which also continually get adjusted with the latest thinking and/or processes developed to avoid the last set of overruns. With cross-agency efforts increasing, the plethora of policies and practices are becoming inhibitors, and are often overwhelming for everyone in the environment.

“... federal IT projects too frequently incur cost overruns and schedule slippages while contributing little to mission-related outcomes. Given the size of these investments and the criticality of many of these systems to the health, economy, and security of the nation, it is important that federal agencies successfully acquire these systems—that is, ensure that the systems are acquired on time and within budget and that they deliver the expected benefits and functionality.” (GAO, 2011)

A factor in the plethora of policies and practices is the lack of a robust standard management framework from which agencies can tailor a solution. The OMB Circular A-11 and Capital Programming Guide (CPG) (OMB, 2014), outlines “key principles.” David Muzio, who retired from OMB in 2006, led the effort to complete the initial CPG for publication in July of 1997. He noted in a recent discussion 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” (personal communication, January 23, 2015). As noted in the CPG, “agencies are provided flexibility in how they implement the key principles and concepts...” (OMB, 2014, p. 1).

The Government Accountability Office (GAO) developed a *Framework for Assessing the Acquisition Function at Federal Agencies* (GAO, 2005) in September 2005. OMB followed up by adopting the framework published as *Guidelines for Assessing the Acquisition Function* (OMB, 2008). The framework consists of four, interrelated “cornerstones” for an assessment, but does not provide a standard management framework. Project Management Institute’s (PMI, 2013a) *Pulse of the Profession*[®] report found that “[o]rganizations with developed project management practices, benefits realization processes, portfolio management practices and program management practices and those with high organization agility all have significantly better project outcomes than their counterparts who are less advanced in their project management practices” (p. 11). Whitaker (2014), in a paper titled, *The Benefits of Tailoring: Making a Project Management Methodology Fit*, proposed a “model and process for the initial and ongoing tailoring of a project management methodology” (p. 3) as a component for improved project outcomes and better organization efficiency. This paper proposes the federal government would benefit from utilizing PMI’s project, program, and portfolio standards framework as the basis for a common, robust federal system methodology.¹

“Earlier this month, the House passed H.R. 4228, known as the “DHS Acquisition Accountability and Efficiency Act.” The stated purpose of the Act is “[t]o require the department of Homeland Security to improve discipline, accountability, and transparency in acquisition program management.” Apparently, the policies and procedures implemented by the department over the past six years to improve the management of its US\$17 billion in acquisition programs have not been successful and legislative direction is now required to improve things. So, what went wrong and can corrections be made without mandating requirements at the statutory level?” (Essig, 2014)

This paper outlines how three approved American National Standards developed by PMI can provide robustness and clarity, with a common language and a standard framework for agencies’ utilization, as they comply with the OMB A-11 policies and CPG (OMB, 2014) key principles. In fact, if followed in a disciplined manner, the standards provide for significant efficiencies within and across agencies, as well as improved efficiencies with industry. No law or OMB policy needs to change, though a rewrite of the CPG that aligns with PMI standards would further enable the common approach. David Muzio (personal communication, January 23, 2015) expressed: “It is time for a more robust framework and methodology, such as PMI’s standards, which were not available 18 years ago, to be adopted by OMB. The common theme [in the initial effort] of the various development groups that provided their expertise was the desire for the government to gain a reputation of good acquisition management in the quest to provide a government that works better and costs less. Adoption of the new industry good practices will continue that quest.”

The underlying proposition of this paper is that the OMB policy and guidance is neither a complete framework nor is it the reason efforts fail. Whether focused on a hardware or software solution, at a portfolio or project level, or on government or industry teams, a key to success is the disciplined use of a management methodology. Success comes when trained and experienced teams, led by positive-oriented² leaders, implement—with discipline—a linked management methodology that can be embraced given the realities of the environment. Successful projects do not have perfect discipline or leadership, but “enough” discipline and leadership to overcome the shortcomings in the environment in which they find themselves. 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. The guidance is not the reason projects fail because many projects are, in fact, successful in the current environment. Those projects have been successful because the agency and project leadership supplemented the guidance with a robust framework. It is time for a robust framework to be applied to all federal projects—one that neither OMB nor federal agencies need to create from scratch. They just need to adopt the industry standards that have evolved from practical field experience over the past 20 years—much of which has evolved from U.S. Federal government and Department of Defense experience.

Definitions of terms

It is essential to first look at the definition of the term program and how it relates to project and portfolio in the federal government. One has to be careful when using the term program since it has a much broader meaning for a federal agency. Take, for example, the Social Security program (otherwise known as the Old-Age, Survivors, and Disability Insurance federal program). That program includes all systems and offerings of the Social Security Administration as compared to the narrower definition relative to program management as used by the Department of Defense's Defense Acquisition University, NASA's Academy of Project/Program and Engineering Leadership, and PMI. The terminology confusion is more apparent in smaller agencies where PROGRAM³ and programs/projects have similar names or are closer in scope. So when reading government guidance, especially in the strategic planning area, it's essential to determine whether "program" refers to the whole combined effort of individual initiatives, processes and ongoing operations, such as the Social Security PROGRAM, or a program to upgrade the IT infrastructure that helps run the Social Security PROGRAM.

The definitions in federal documentation can be confusing, thus the need for a standard. This paper focuses on the PMI-defined definitions of portfolio, program and project as presented in *PMI Lexicon of Project Management Terms* (PMI, 2012) and PMI global standards. **Table 1** compares the definitions of common terms as defined by the federal government publications and by PMI.

Term	U.S. Federal Government Definition	PMI Definition
Portfolio	Grouping of capital asset programs/ projects, typically at the agency level and often focused on information technology (OMB, 2014, section 55.6).	Projects, programs, subportfolios, and operations managed as a group to achieve strategic objectives (PMI, 2012).
Program	Generally, an organized set of activities directed toward a common purpose or goal that an agency undertakes or proposes to carry out its responsibilities (GAO, 2005, p. 79). 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 (OMB, 2014, p. 93).	A group of related projects, subprograms, and program activities that are managed in a coordinated way to obtain benefits not available from managing them individually (PMI, 2012).
Project	A temporary endeavor to create a unique product or service with a start date, a completion date, and a defined scope (OMB, 2014, p. 93).	A temporary endeavor undertaken to create a unique product, service, or result (PMI, 2012).

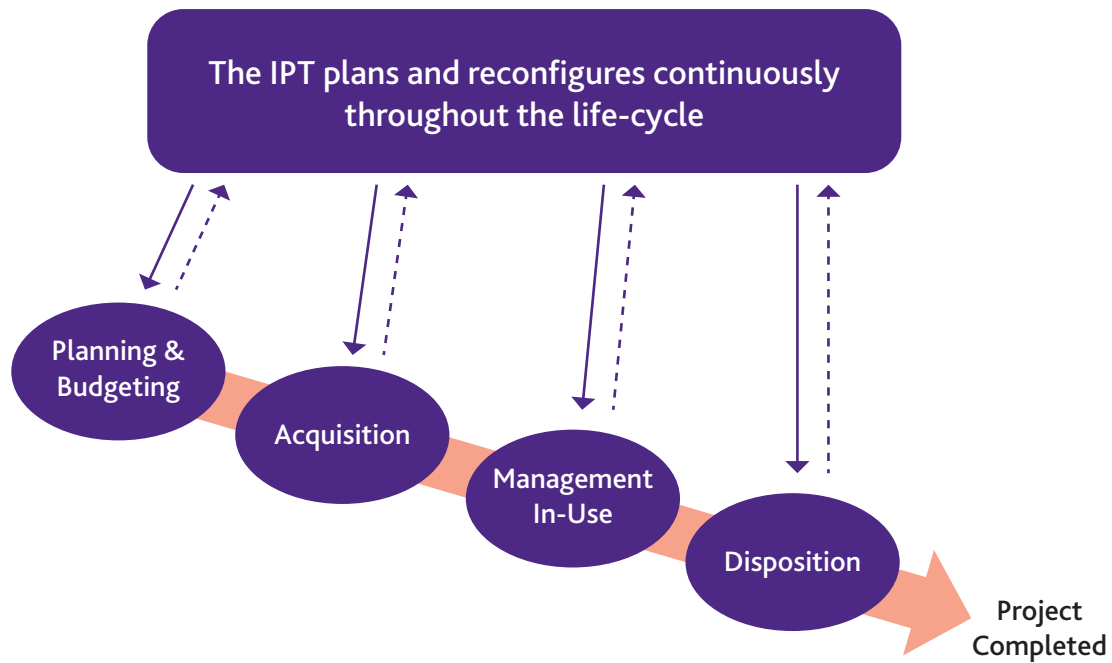
Table 1: Comparison of definitions between U.S. government and PMI publications.

Federal System Acquisition Management Framework

Each federal agency builds its own system acquisition management framework. Federal agencies and their industry partners have many cultural challenges with layers of rules, many of them unique to individual context and ever-changing customer expectations. Many projects find themselves in a challenging, if not hostile, environment that is inhibiting the team and leaders from delivering value. Following a disciplined system acquisition management framework can overcome these challenges. Successful efforts require trained and experienced team members led by leaders who implement a disciplined process, custom-fitted to the unique demands of the project or program (Whitaker, 2014).

The current policies within the federal government form a basic lifecycle framework and can be traced back to OMB (1976) *Circular A-109: Major System Acquisition*, issued 5 April 1976. That policy called for a “systems acquisition management” approach with an assigned program manager. The document was 10 pages in length and was the start of a common federal approach. Today, OMB’s principle guidance is in the almost 100-page Capital Programming Guide (CPG), a supplement to OMB A-11, which is itself over 900 pages and concentrates on the federal budget. OMB policy and guidance is a very top-level framework or lifecycle (see **Figure 1**) for system acquisition management or what is known today as capital asset planning and management. The guidance highlights key principles, but does not provide a complete system management framework. Individual agencies publish additional policies and procedures, which in some cases consists of hundreds of additional pages. The GAO has also published guidance on best practices related to program management. Over the years the U.S. Congress has passed numerous laws related to major system acquisition, including the Federal Acquisition Streamlining Act (1994), Federal Acquisition Reform Act and Information Technology Management Reform Act (1996), and Government Performance and Results Act (1993 and 2010). Despite all the laws and policies, overall there is not a lot of prescription and the frameworks tend to be incomplete.

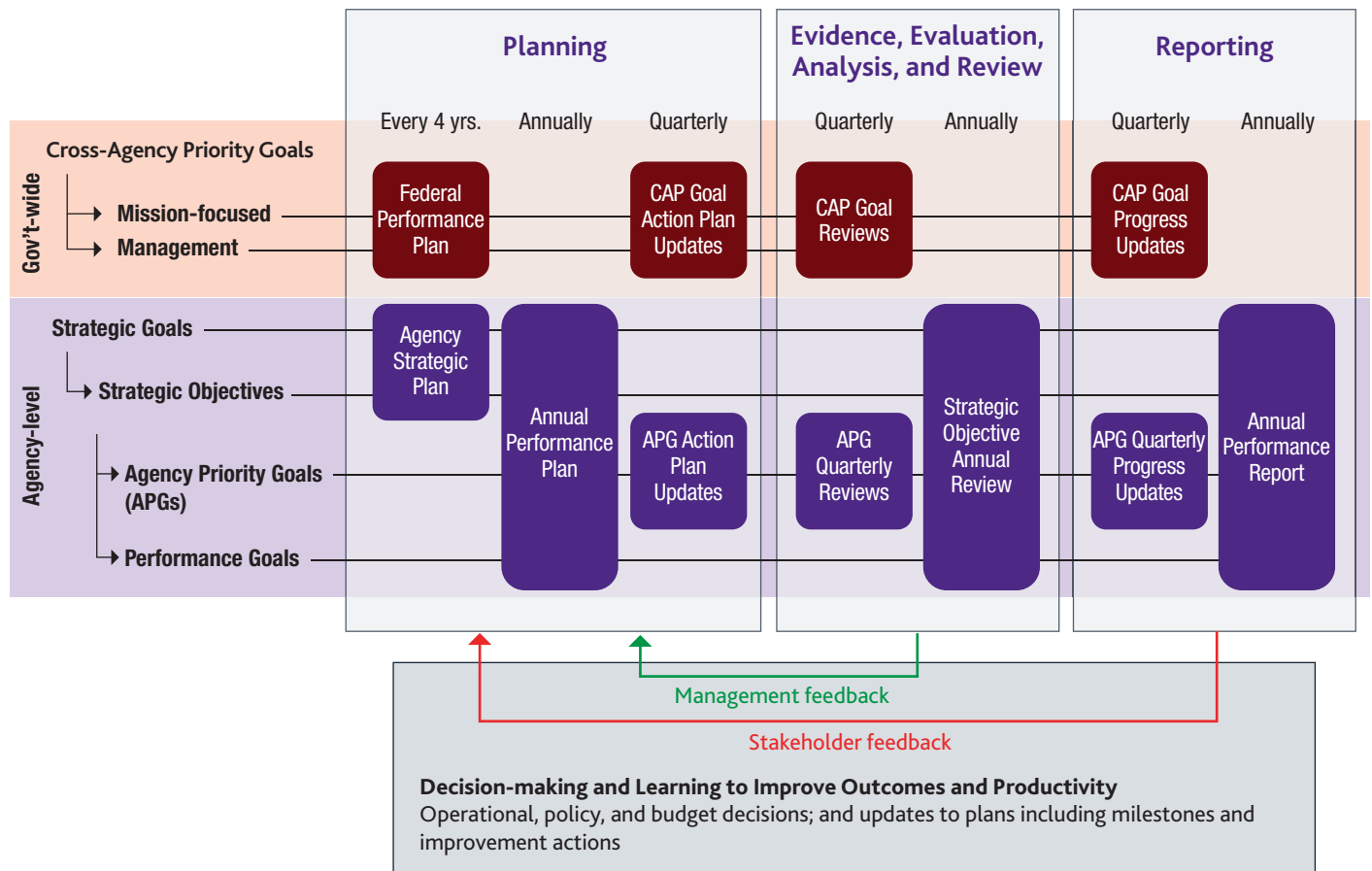
Today, each federal agency builds its own lifecycle governance framework. In fact, it would be impossible to find a single federal agency that follows the basic CPG four-phase process shown in **Figure 1**. Each agency publishes a lifecycle of its own. Some are common or very similar, but there are probably a dozen distinctly laid out agency lifecycles, which often do not show a linkage to the agency’s strategic planning process.



Source: OMB Capital Programming Guide, Figure 1, p. 6

Figure 1: The Capital Programming Guide’s capital planning lifecycle.

Federal agencies’ strategic planning policy is laid out in OMB’s (2014) Circular No. A-11, Part 6, which also outlines the requirements for strategic planning. This process, which has evolved considerably in the past decade, starts with strategic objectives, then identifies goals, which drive improvements in capital assets, which then require investments (see **Figure 2**). The CPG (OMB, 2014) notes, “Agencies should choose a portfolio of capital investments that maximizes return to the taxpayer...” (p. 19). The key principle is for the effort’s requirements to link back to agency goals and objectives.



Source: OMB A-11, Part 6, p. 3

Figure 2: OMB Circular No. A-11 Performance Management Cycle.

For federal agencies, oversight management as a minimum is done by an executive review committee (ERC), which oversees “an Agency Capital Plan [ACP] that defines the long-term agency capital asset decisions. The ACP should include an analysis of the portfolio of assets already owned by the agency and in procurement, the performance gap and capability necessary to bridge it, and justification for new acquisitions proposed for funding” (OMB, 2014, p. 20). The CPG further states, “[i]n addition to review by the ERC, each project requires an Integrated Project Team(s) (IPT) composed of a qualified program manager and necessary personnel from the user community, budget, accounting, procurement, value management, and other functions to be formed...” (p. 3). Appendix 2 of the CPG further defines the role of the IPT and notes, “Agencies should apply an integrated project and process development (IPPD) approach to manage capital assets...” (p. 57). This IPPD approach evolved within the Department of Defense and is key to the systems management approach, which assigned the program manager the responsibility from Planning phase to Management In-Use phase.⁴

Note the mixing of the terms and responsibilities for project team and program manager. In A-11/CPG (OMB, 2014) and much of the federal guidance, there is very little distinction between project, program or even portfolio management. Guidance is generally laid out on two levels (project manager and the ERC), which is not reflective of the ways these efforts are actually executed. No federal agency has its project managers reporting directly to the ERC without some level of management in between. A-11/CPG guidance jumps from the ERC to the project manager with little guidance on the intermediate organizational structure other than the IPT discussion.

The link that connects the strategic planning and capital asset management to individual system acquisition management is neither laid out in the A-11, nor in the CPG. Those details are left to agencies to define and execute. The Department of Defense (DoD) and National Aeronautics and Space Administration (NASA) have developed “Wall Charts,” which outline the various decisional support systems that make up their overall system acquisition management frameworks and help identify the linkages. The wall charts are detailed expansions of the CPG lifecycle chart in **Figure 1**. Most agencies do expand the CPG’s lifecycle and have some flow diagram or chart that has an emphasis on the governance process—in other words, the gates to proceed from one stage to another. What is often not clear is the linkage between these high-level stage gates and specific portfolios that evolve into the specific agency projects that are executed. Additionally, the linkage of the practices, techniques, procedures and rules from the strategic goals to the portfolios of programs and projects is undefined.

OMB (2014), Appendix J is organized into four sections titled Planning, Cost and Benefits, Principles of Financing and Risk Management. There is almost no guidance from OMB in A-11 or the CPG on how the capital assets acquisition should be managed or organized in relation to the other efforts in the agency’s investments.

Examine the CPG (OMB, 2014) Capital Planning Lifecycle in **Figure 1**. Note that at the acquisition stage there is no “lifecycle,” but a process cycle that typically is standardized and recurring. It is a continuous process in which “certain activities may follow a recurring timeframe, such as annually or as determined by the organization” (PMI, 2013c, p. 25). For federal agencies, this is the fiscal year starting 1 October and is centered on the strategic planning and budget process as outlined in A-11. But, there is no clear linkage between acquisition and programs and projects. Such a linkage is the key to project success; therefore, development of an agency strategic portfolio plan is essential to jump starting the planning of specific programs and projects. CPG implies such a plan should be developed, but has no process by which an agency approves or manages as a strategic level plan. OMB guidance is starting to require an explanation of how IT programs and projects fit into an overall IT portfolio as part of the business case, but this is not a plan as much as a report. A-11 does call for linking of the strategic plan and annual performance plan to the agency’s enterprise architecture. One could also look at the agency’s Enterprise Architecture and Enterprise Roadmap (see A-11, Section 55 (OMB, 2014)) as the portfolio strategic plan and portfolio roadmap for the IT capital assets, but most agencies have more assets than just IT. Where is the portfolio charter that would define the team that is to manage these strategic activities and their relationships with programs and projects?

The OMB E-Government chief information officer (CIO) has recently started to drive portfolio reviews in the IT arena, and portfolio descriptions have started to be added to the individual project business cases/reporting processes called out in OMB (2014) A-11/CPG. But no overall structure and process flow has been laid out in the federal guidance; therefore, there is no standardized approach across the federal agencies. The impact of this is best seen in the lack of training for the portfolio level personnel in federal training requirements.

PMI Standards Framework

PMI defines Organizational Project Management as “a strategy execution framework that utilizes portfolio, program and project management as well as organizational enabling practices to consistently and predictably deliver organizational strategy to produce better performance, better results...” (PMI, 2013e). This paper references that framework as the OPM framework.

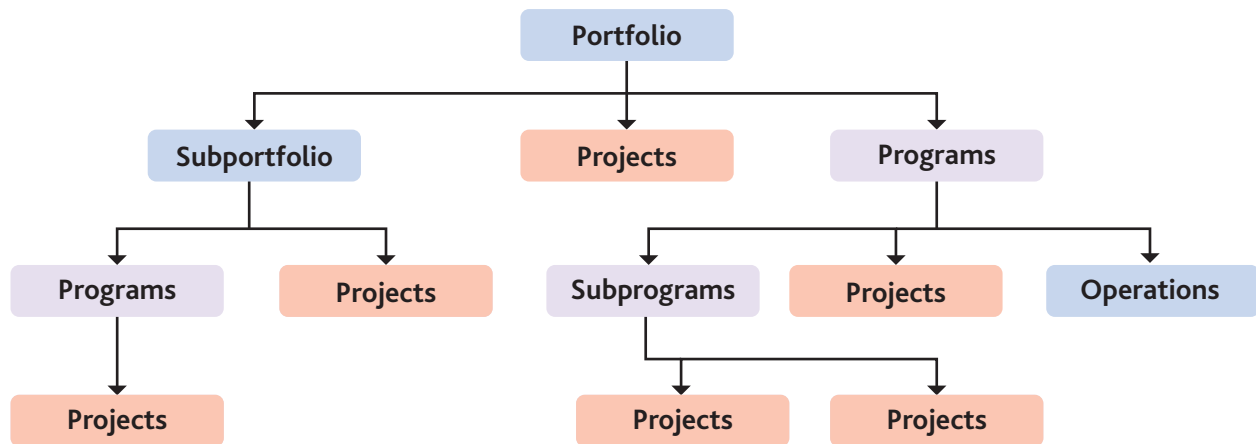
The OPM framework shown in **Figure 3** is a comprehensive approach that ties the organization’s activities to its strategic plan. Strategy development begins with a consideration of the mission and vision of the organization in light of the environment in which it operates and the internal capabilities or needed capabilities of the organization. Once the strategic plan is formulated, portfolio management aligns the activities of the organization in support of the strategic plan through initiation and oversight of specific programs and projects along with ongoing operations. At the portfolio level, possible solutions (programs and projects) to deliver the objectives of the strategy are evaluated, which enables the selection of the best alternative from among a number of possibilities for delivering the strategic objectives.



Source: Adapted from *The Standard for Portfolio Management*, Figure 1-3, p. 8

Figure 3: PMI standards organizational framework.

Strategic plans are not static. Due to the ever-changing environment in which the organization operates, it is necessary to adjust strategy based on both external and internal dynamics. PMI (2012) defines portfolio as, “[p]rojects, programs, subportfolios, and operations managed as a group to achieve strategic objectives.” This structure, as depicted in **Figure 4**, enables the portfolio manager to monitor changes to the strategic plan and the overall performance of the programs and projects within each portfolio with respect to the strategic objectives.



Source: *The Standard for Portfolio Management, Figure 1-1, p. 3*

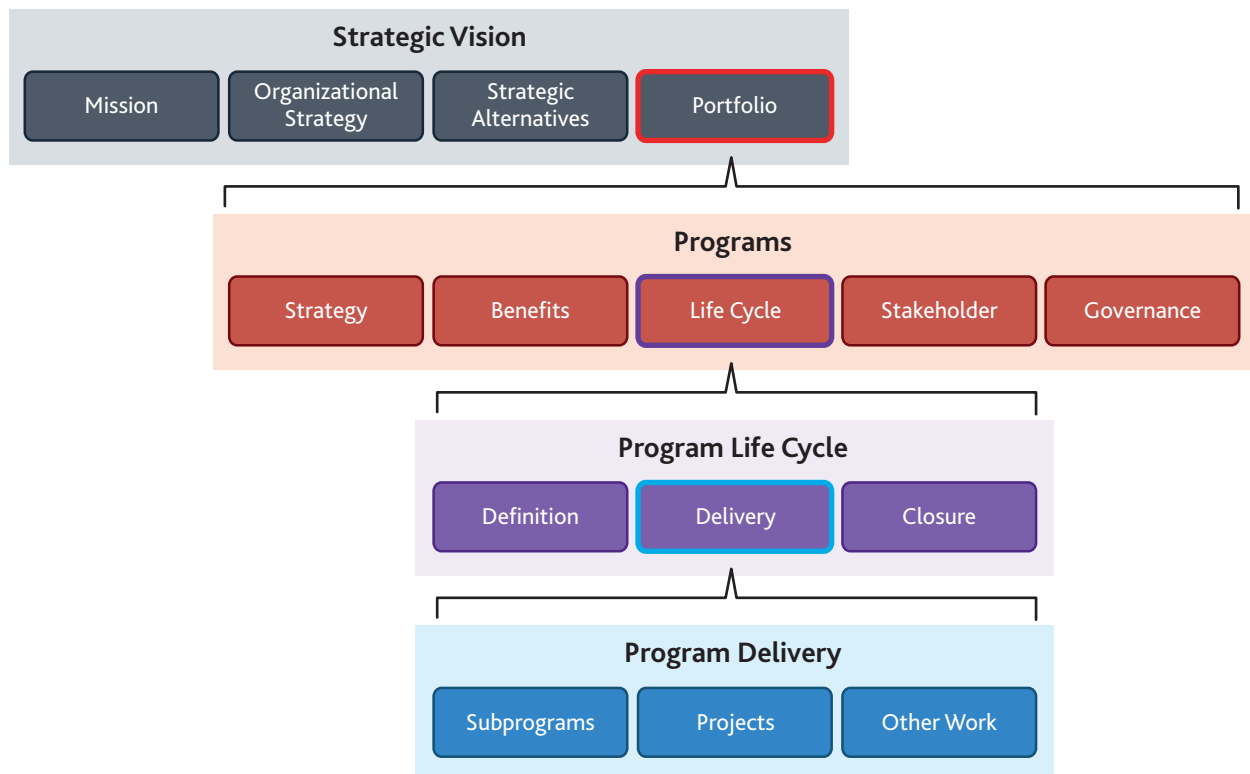
Figure 4: High-level view of the interrelationship between portfolios, programs and projects.

Programs, defined as “[a] group of related projects, subprograms, and program activities that are managed in a coordinated way to obtain benefits not available from managing them individually” (PMI, 2012), provide the execution engine whereby benefits are defined and managed. Programs then initiate projects, defined as “temporary endeavor[s] undertaken to create a unique product, service, or result” (PMI, 2012), which are the mechanism through which specific solutions are developed and whose output then enables the benefits defined in the program to be realized.

The approved American National Standards developed by PMI, when looked at as a multi-tiered structure, provide an excellent framework for understanding how to implement OMB’s key principles in a disciplined manner within a complete framework. Most agency policies and procedures don’t outline a portfolio-to-program-to-project structure with a linkage to organizational strategic planning. The American National Standards provide this structure, which is a key aspect in understanding a framework’s governance environment and to know whether the team needs to accomplish program and portfolio efforts at the project level or whether those are being accomplished for them by a program or portfolio management team.

Mapping Federal Guidance to the PMI Standards

When exploring PMI standards as a framework to meeting federal government guidance for capital asset acquisition, it is important to first understand the scope of the enterprise. Portfolios, programs, and projects live within organizations with a mission and an organizational strategy. As outlined in **Figure 5**, the relationship among portfolios, programs, and projects comes from a review of the possible strategic alternatives and the combination in which they are currently being pursued with a portfolio of investment. For most federal agencies, the mission is multifaceted and, therefore, there are typically (or should be) multiple portfolios.



Source: *The Standard for Program Management*, Figure 1-5, p. 12

Figure 5: Relationships among portfolios, programs and components.

As a result each portfolio has programs with strategy, benefits, a lifecycle, stakeholders, and governance structure. Within the program lifecycle there are individual subprograms, projects and operations activities. This structure is referred to as the portfolio breakdown structure.

Whitaker (2014) notes that each organization (in this case, government agency) needs to do some tailoring of processes within a given structure, but this can be accomplished within the four parts at the strategic vision level of the enterprise: Mission, Organizational Strategy, Strategic Alternatives, and the Portfolio. Also note that with this tiered approach, the portfolio domain can enable an effective and efficient balancing of resources across the entire organization.

The four tiers PMI has laid out can be reduced to three or even two tiers, if appropriate, but the associated activities for each tier cannot be overlooked or bypassed. Using project management concepts, it is possible to look at each tier and split the work (the function of the portfolio breakdown structure) and who does the work (the function of the organizational breakdown structure). It's possible to have a PMO, whether the "P" represents portfolio, program or project, doing the activities across the bottom three tiers, but it is very likely that any one project is one part of an overall program, which is contained within an overall portfolio. In fact, as PMI standards allow, there may be multiple tiers of projects and programs with multiple portfolios within an organization. This would be true for most federal agencies, even the fairly small, independent agencies. Additionally, with the segmentation of efforts, A-11/CPG (OMB, 2014) implies that each phase in the lifecycle is a project with a specific start, end and funding line. This key principle in OMB guidance further drives the need for establishing a robust framework for portfolios, programs, and projects.

A project-based methodology aligned to PMI standards has been evolving across several federal agencies not as policy, but as a common-sense approach. That common-sense approach can be expanded to include not only *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)* (PMI, 2013b), but also *The Standard for Program Management* (PMI, 2013d) and *The Standard for Portfolio Management* (PMI, 2013c). The linked solution neither requires additional laws to be passed, nor for revised OMB policies to be implemented. For federal acquisition leaders and managers, PMI standards and practice guides are becoming a common thread. Many agencies support their managers in obtaining the Project Management Professional (PMP)® credential, thus providing common core competencies that complement a common language with the *PMBOK® Guide* (PMI, 2013b). PMI standard Knowledge Areas have started to appear in project management plan templates and other common artifacts at the U.S. Department of Health and Human Services' various components and other agencies. At the start of 2014, the U.S. Department of Housing and Urban Development CIO dropped the department's software lifecycle development process and replaced it with a lifecycle that follows the *PMBOK® Guide* (PMI, 2013b) Process Groups. Parts of the PMI standards are appearing across many aspects of the federal acquisition environment. These efforts are a great start, but they need to go beyond the *PMBOK® Guide* (PMI, 2013b) and include the program and portfolio standards in a linked methodology. The effort also needs to be cross-agency to maximize the benefits in a common, disciplined approach.

Closing the gaps

The Standard for Portfolio Management (PMI, 2013c) recognizes the need for "a tight linkage between the Portfolio Management Process Groups and the ongoing organizational process cycle of developing an organization strategy, aligning all portfolio components to that strategy, and monitoring the results of these decisions. The portfolio management processes act as a series of interrelated processes or bridge between the organizational strategy and the programs/projects that are part of the tactical work to deliver on the goals, objectives, and strategies of the organization" (p. 32). The linkage is discussed in A-11/CPG (OMB, 2014), but the details on how to make the linkage are not presented. This is where the PMI standards prove useful by providing a structure that clearly lays out activities by Process Groups and Knowledge Areas (see **Figure 6**). Following *The Standard for Portfolio Management* (PMI, 2013c) allows agencies to not only plan each portfolio well, but also to plan and execute across multiple portfolios aligned to a portfolio strategic plan and roadmap.

Knowledge Areas	Process Groups		
	Defining Process Group	Aligning Process Group	Authorizing and Controlling Process Group
Portfolio Strategic Management	4.1 Develop Portfolio Strategic Plan 4.2 Develop Portfolio Charter 4.3 Define Portfolio Roadmap	4.4 Manage Strategic Change	
Portfolio Governance Management	5.1 Develop Portfolio Management Plan 5.2 Define Portfolio	5.3 Optimize Portfolio	5.4 Authorize Portfolio 5.5 Provide Portfolio Oversight
Portfolio Performance Management	6.1 Develop Portfolio Performance Management Plan	6.2 Manage Supply and Demand 6.3 Manage Portfolio Value	
Portfolio Communication Management	7.1 Develop Portfolio Communication Management Plan	7.2 Manage Portfolio Information	
Portfolio Risk Management	8.1 Develop Portfolio Risk Management Plan	8.2 Manage Portfolio Risks	

Source: *The Standard for Portfolio Management, Table 3-1, p. 31*

Figure 6: Mapping of the Portfolio Management Process Groups and Knowledge Areas.

In the portfolio strategic plan the “portfolio is aligned to the organizational strategy and objectives for the corporate, organization unit, functional, or department level, based on portfolio management objectives, prioritization, allocation of funds, organizational benefits, performance expectations, resources, assumptions, constraints, dependencies, risks, and requirements” (PMI, 2013c, p. 41). One federal agency with several portfolios is writing a single portfolio strategic plan with an integrated portfolio roadmap that covers all portfolios. This single plan/roadmap is updated and aligned with the agency’s annual budget/strategic planning process, thus assuring a clear linkage between the agency strategic plan and the portfolio structure. This plan is approved by the agency’s ERC and becomes the guidance document for the structure of the portfolios, programs and projects.

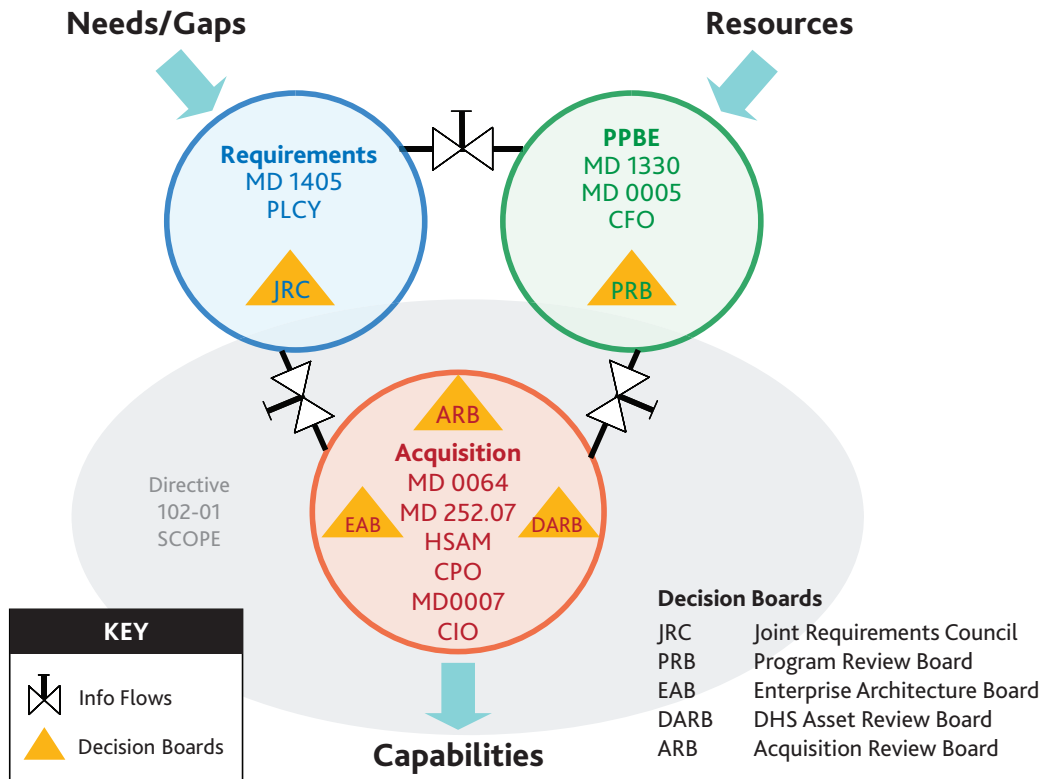
With each portfolio using the PMI standard, a charter and roadmap can be developed as part of the Defining Process Group using the Portfolio Strategic Management Knowledge Area. This type of effort is essential

to establishing a clear vision for each portfolio, but is not outlined in A-11/CPG (OMB, 2014). Appendix J in A-11 calls for an “acquisition strategy” as part of the planning process. The Federal Acquisition Regulation (GSA, 2005), in Part 34, requires that the “program manager, as specified in agency procedures, shall develop an acquisition strategy tailored to the particular major system acquisition program. This strategy is the program manager’s overall plan for satisfying the mission need in the most effective, economical, and timely manner” (section 34.004). The acquisition strategy for most agencies is a contract document, but should be a comprehensive document for the program. In many agencies, the program manager is a system manager responsible for current, next, and future segments of the system. Thus, in PMI terms, they are portfolio managers who also have program management and possibly project management responsibilities.

Tiered structure

The tiered structure in the PMI standards is a key to governance and understanding the distinct strategic and tactical activities. The federal policy and guidance implies such a structure with the discussion of portfolios, but it is not well defined in A-11 and the CPG. Section 1.5.8 of the CPG (OMB, 2014) proposes that during the planning phase there is a need for comparison with all capital assets in the portfolio regardless of how that portfolio is structured. No guidance is given with respect to the structure. The role of the project manager is also unclear. For CPG, one could conclude that portfolio management is the role of the ERC; realistically that committee might oversee such a process, but who is actually going to “define” and “align” the various projects within their program/portfolio structure(s)? This work is for the portfolio manager to accomplish across the whole of the portfolio. As previously noted, maybe the project manager is playing all roles, but the portfolio activities, such as optimizing the portfolio programs and projects, still need to be accomplished. Filling this gap would improve clarity on who is responsible for each of the standards’ activities. It is essential to remember the PMI standards activities are the minimum of what needs to be accomplished for good practices. On top of that, the unique A-11/CPG requirements and key principles can be mapped so the framework is tailored to the federal environment.

The ERC for some agencies is consolidated into one entity. For other agencies, especially the “differentiated group,” the ERC is usually broken up across requirements, resources, and acquisition, what is known as the three decision support systems. This is true for the U.S. Department of Homeland Security as depicted in **Figure 7**. The Joint Requirements Council is focused on the requirements; the Program Review Board is over the resource process (remember, this PROGRAM is talking about mission PROGRAMs), and the Acquisition Review Board oversees the capital investments activities. (Don’t confuse this acquisition with procurements only; acquisition is what is commonly referred to as big A.) In general, the Acquisition Review Board is the overall controlling ERC, but integration is needed with the other two councils/boards. In some agencies, it is not even clear who is really fulfilling the role of the CPG’s described ERC function, because mission operations governance is often interwoven with the capital investment governance structure. Even organizations that have focused on the *PMBOK® Guide* (PMI, 2013b) processes at the project level appear to have a structure for the program or portfolio level that does not align with PMI standards in those domains, thereby running the risk of missing a clear link through a tiered structure to the agency’s strategic plan.



Source: Department of Homeland Security Acquisition Instruction/Guidebook (http://www.it-aac.org/images/Acquisition_Instruction_102-01-001_-_Interim_v1.9_dtd_11-07-08.pdf)

Figure 7: U.S. Department of Homeland Security’s equivalent of CPG’s Executive Review Committee.

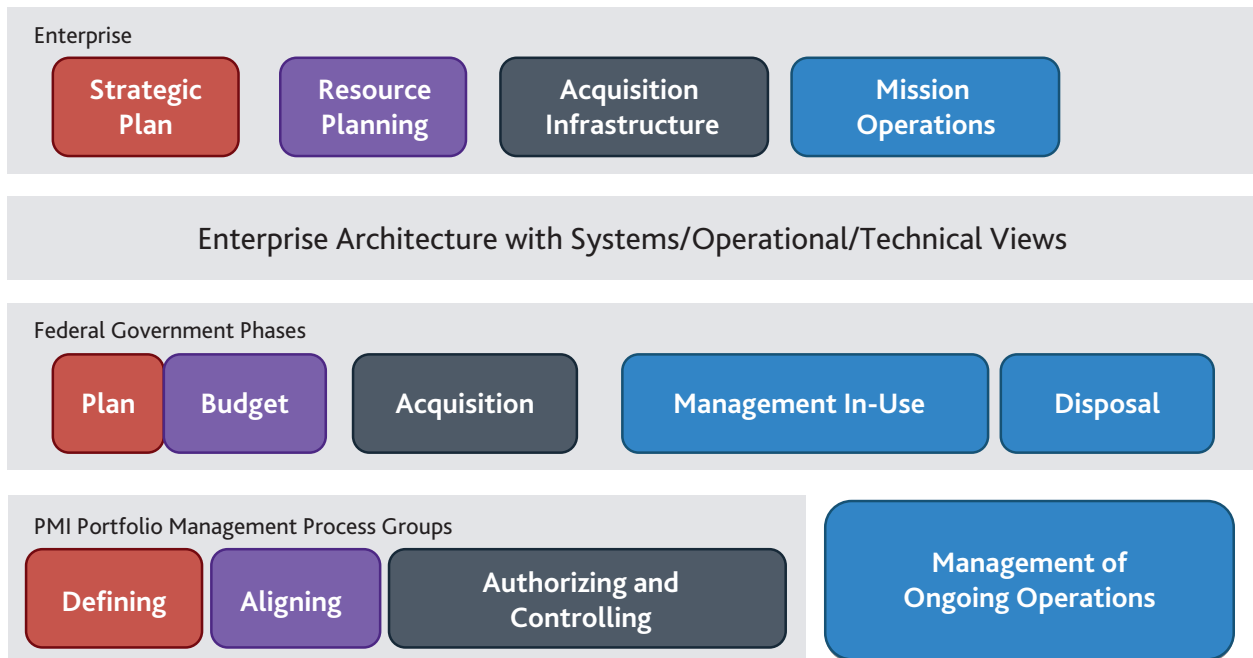


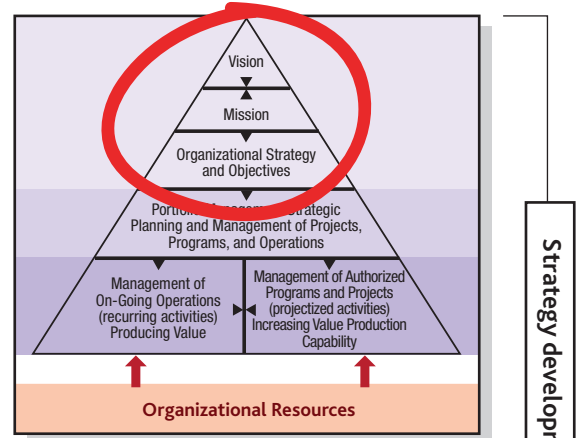
Figure 8: Comparison of CPG’s Capital Planning Lifecycle and PMI’s portfolio management standard.

Figure 8 shows the four parts of the enterprise mentioned earlier color-coded and then coordinated with the related enterprise functions that are outlined in the CPG Lifecycle and PMI's Portfolio Management Process Groups. This is the appropriate place to align CPG's Lifecycle with PMI standards—at the portfolio level. The CPG Lifecycle has been aligned with the Portfolio Management Process Groups.⁵ This is an example where common terminology usage can clear up confusion across agencies and with industry-standard terminology.

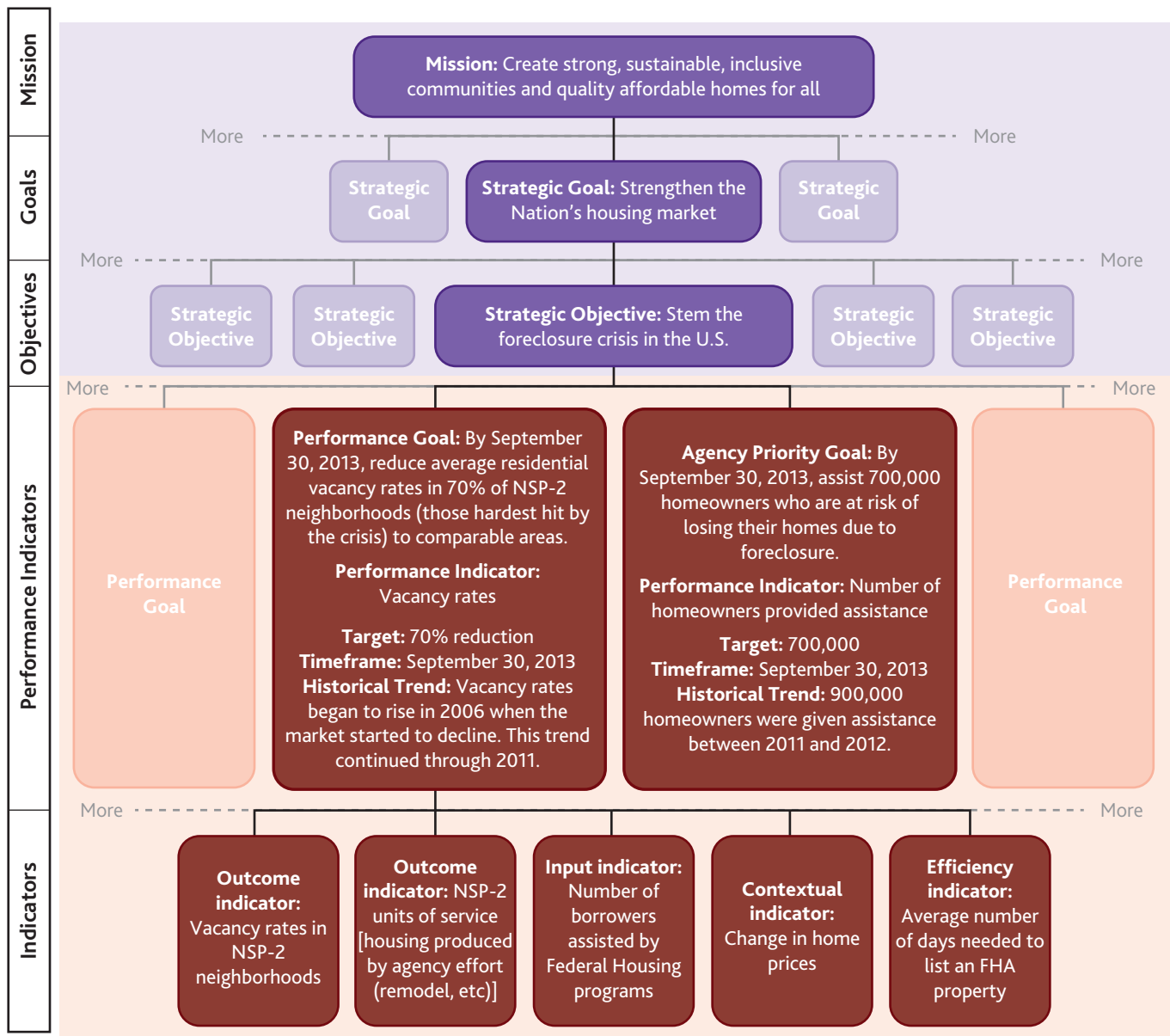
It's clear that the alignment is not perfect, as the CPG Plan/Budget phase is split to align with the separate Portfolio Management Process Group Defining and Aligning. The Portfolio Authorizing and Controlling phases have also been aligned with CPG Lifecycle's Acquisition Phase. PMI describes the management of on-going operations, which aligns with the "Management In-Use" and "Disposal" phases in the CPG Lifecycle. The significant point is that these are often outside the realm of the portfolio, program or project manager in the federal government, unless the agency is truly following a systems approach, often referred to as *Total Life Cycle Systems Management*. The Department of Defense follows this approach; the capital asset is turned over to mission operations for on-going operations, but the systems manager maintains oversight, as PMI outlines as a possible role for the portfolio manager. The relationship and interface between the portfolio, program, and project managers and the on-going operations can be a significant challenge; however, this paper only concentrates on the capital asset planning and acquisition phase.

A comparison (shown in **Figure 9**) of OMB's illustration of goals and PMI's OPM framework shows alignment between the mission/goals/objectives of OMB and the vision/mission/strategy of PMI's OPM framework. The approaches are very similar. In PMI's framework, the objectives are met by a portfolio manager who ensures alignment between ongoing operations and authorized programs and projects. *The Standard for Portfolio Management* (PMI, 2013c) states, "[t]he portfolio manager may be an individual, a group, or a governing body, and is responsible for establishing, monitoring, and managing all assigned portfolios" (p. 14).

So how would all of this work? PMI's OPM framework provides specific knowledge activities at each level, which an agency can build upon and custom fit to its needs. The first tier, which both PMI and OMB recognize, is at the organizational strategy and objectives level—just above the portfolio(s) as shown in **Figure 9**. This is really where the OMB A-11/CPG ERC starts. For federal agencies, this would be the chief operating officer (COO) and whatever oversight committee structure the COO uses to manage. The question, then, is this: Is the COO/ERC fulfilling the role of portfolio manager also, or is there someone else designated to fill that role? For federal agencies, this



Source: The Standard for Portfolio Management, Figure 1-3, p. 8



Note: All data is illustrative only. Information was modified for illustrative purposes and does not represent a real agency example. Source: OMB A-11, Section 200.22

Figure 9: OMB's goal illustration and PMI's OPM framework.

could and probably should be the chief acquisition officer.⁶ The project manager should understand at the very senior level where the strategy, objective and project requirements are coming from. For an organization like the Federal Aviation Administration (FAA), this would be the Joint Requirements Council. In the Department of Defense it is the Joint Requirements Oversight Council run by the Joint Chiefs of Staff. In smaller federal agencies it is often not clear, which is where the problems start with projects—creating obfuscation over requirements and how they link to strategy and objectives. The process is then repeated at the program and then the project level with specific knowledge activities.

The approach can work for small or large agencies. An FAA example is outlined in the Appendix at the end of this paper. Generally, the larger agencies, such as the FAA, have fairly robust capital investment processes, but they are not complete structures that link agency strategies to projects. As outlined in the example, following the PMI OPM framework can provide clarity and discipline with the implementation of the PMI standards as a baseline.

Define portfolios within an overall framework

In OMB (2014) Circular No. A-11, Appendix J, four sections entitled Planning, Cost and Benefits, Principles of Financing, and Risk Management align loosely with the PMI Portfolio Management Process Groups: Defining, Aligning, and Authorizing and Controlling. The term acquisition is used to represent what PMI calls the portfolio. If the federal capital investments are put into a portfolio–program–project structure, it is relatively easy to map the A-11/CPG policy and key principles into that structure and thus the PMI standards' Knowledge Areas and Process Groups, which then make up a comprehensive framework.

Neither PMI nor OMB state how the portfolios should be organized, but PMI does outline that a schema should be developed such that each portfolio has a clearly defined scope and doesn't encroach on other portfolios. This would be the function of the portfolio charter. One can see this type of structure with the Department of Homeland Security's Customs and Border Protection, where component acquisition executives oversee all capital assets and a program executive officer oversees the Secure Border Initiative PROGRAM. But this is not a common practice across agencies. One smaller agency created portfolios for each of the strategic initiatives outlined in its agency strategic plan using PMI standards as a framework. Each initiative had clear stakeholders and sponsors with specific goals/objectives. The action required to meet these goals/objectives could then be laid out in specific programs and projects. The ongoing operations affected by these programs and projects are not within the portfolios, thus the portfolio manager is only responsible for programs/projects. In some agencies, a more systems management approach is taken and the portfolio manager has both the programs/projects as well as the ongoing operations. A-11/CPG, with the "management in-use" phase of the lifecycle, implies that a project/program or portfolio manager would be responsible for the whole lifecycle. This systems approach is taken by the Department of Defense (DoD), where, for example, the F-16 Systems Program Office is responsible for all F-16s, whether they are in development, production or operations. Most federal agencies don't take this systems approach, which can complicate who is responsible for the overall system in the portfolio.

What is not clear is how these portfolios of systems, or capabilities, actually flow through the CPG lifecycle and key principles. The uninitiated who reads the CPG might think to walk through the lifecycle in a serial manner, but that assumes no current system exists, which is not very likely. For most projects in the federal government, they are parts of a system that does have ongoing operations, so while the current system is in the Management In-use phase, prior systems may still be in Disposal and the next system in Acquisition with the future system in Plan/Budget as part of the Agency's strategic planning process as illustrated in **Figure 10**. The systems portfolio manager should be managing the various states of the system through the phases of the lifecycle, whether that

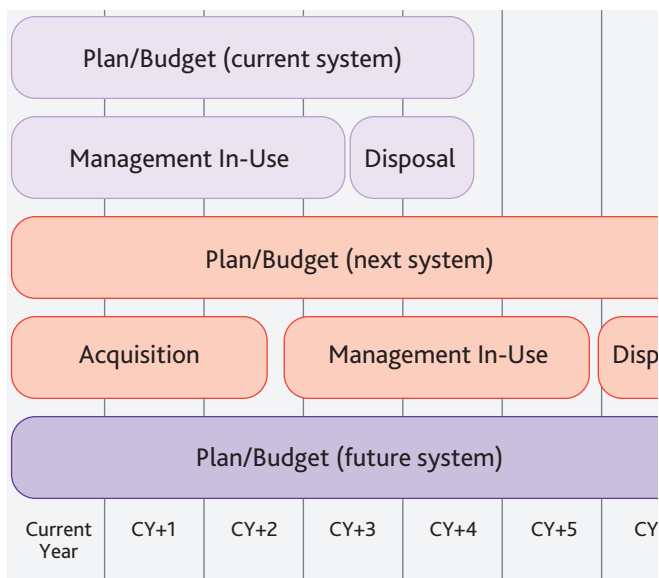


Figure 10: Multi-year planning and budget management.

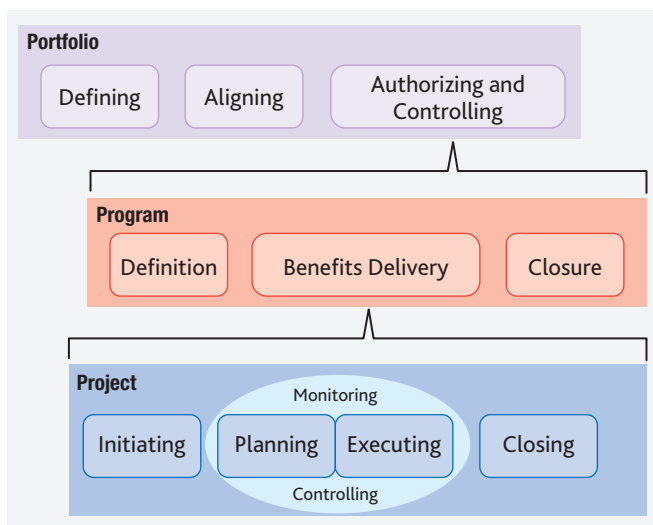


Figure 11: Relationship of PMI standards' lifecycle phases.

authorized and controlled as part of the portfolio. **Figure 11** shows how a project can have the scope of further defining the benefits delivered to the program. The concept is supported in the A-11 Appendix J (OMB, 2014), which states “OMB recognizes that many agencies are in the middle of ongoing investments...OMB will consider requests to use current year and budget year funds to finance additional planning, as necessary, to support the establishment of realistic cost, schedule, and performance goals...”(p. 2). Basically, the portfolio, program or project manager can fund a planning phase effort as a project or even a program with multiple projects. Given the complexity of many federal PROGRAMS, it is reasonable that this Plan/Budget phase should be treated as a program or project(s) itself. In the benefits delivery phase, one or more programs and/or projects could be executed, especially in overlapping segments, each delivering benefits. Here again, *The Standard for Program*

is the CPG lifecycle or whatever lifecycle an agency uses. It should also be noted that each year the Plan/Budget phase is repeated, even if the project, in theory, has multi-year funding. Those funds—whether from prior years, the current year, or future years—will go through the process annually. The strategic planning is required to be updated every four years, which is aligned with presidential terms. In most agencies there is some type of update in the planning process, which is aligned with the budget update. Therefore, the CPG chart on the lifecycle is deceiving, as the plan/budget phase is not a one-time effort, but really a repeated annual phase.

At any particular time a federal portfolio, program or project manager might be planning/ budgeting for the current system in Management In-Use phase, the next system in the Acquisition phase, and the future system in the Plan/Budget phase as shown in **Figure 10**. This can be further complicated in the federal government with multi-year funding, which can mean a federal portfolio, program or project manager might be in the Plan/Budget process for prior year efforts going back several annual cycles. The complexity, even for smaller agencies, can overwhelm if not managed within a structured and disciplined set of activities.

From the portfolio view, then, the federal portfolio, program or project manager needs to figure out how he or she will organize the specific programs and projects given the current, next, and future system realities. These “phases” are PMI-defined programs and projects with specific lifecycles. Each program and project is

Management (PMI, 2013d) notes, “[d]epending on the nature of the program, the program roadmap may be defined to produce incremental benefits... Some programs deliver benefits only after all of the component projects have been completed” (p. 34). This aligns with the segmented approach noted in Appendix J (OMB, 2014), which states under Principles of Financing, Principle 1: Full Funding, “budget authority sufficient to complete a useful segment of a capital project (or investment) (or the entire capital project, if it is not divisible into useful segments) must be appropriated before any obligations for the useful segment (or project or investment) may be incurred” (p. 3). The bottom line is that program and project definitions need to be aligned with the resource process. For most federal agencies, that is outlined in A-11.

There are similarities across the portfolio, program, and project levels and it might seem redundant to have knowledge areas addressed again at various levels, but this is actually very key to success. The knowledge/supporting areas are similar, especially between programs and projects, but they do have different emphases. The Knowledge Area chart in **Figure 12** outlines those areas that link across the portfolio, program and project, starting with Strategic Management (portfolio) and Integration (Program/Project). These areas provide the linkages between the three levels along with connections to the level(s) above portfolio within the agency strategy planning. Performance Management (Portfolio) aligns with Scope Management (Program/Project); Communications and Risk align across all three with the same term. The unique area for portfolio is governance, which is a key area to understand and can often be unclear in federal agencies, as previously discussed. How will the portfolio/program/projects be governed? OMB (2014) A-11/CPG speaks to the executive review committee and the four phases in the lifecycle, but does not outline a stage-gate process. This is why both the Portfolio Strategic Plan and the Portfolio Management Plan are critical in clarifying the governance structure between the ERC and the individual federal project officers. As noted in the CPG, federal agencies often work in an integrated project team structure in which there is neither a supervisory relationship nor a clear identification of a PMO that has management responsibilities for portfolios, programs, and projects.

Portfolio	Program	Project
• Strategic	• Integration	• Integration
• Governance		
• Performance	• Scope	• Scope
	• Schedule	• Time
	• Financial	• Cost
	• Quality	• Quality
	• Resource	• Human Resources
• Communication	• Communications	• Communications
• Risk	• Risk	• Risk
	• Procurement	• Procurement
		• Stakeholder

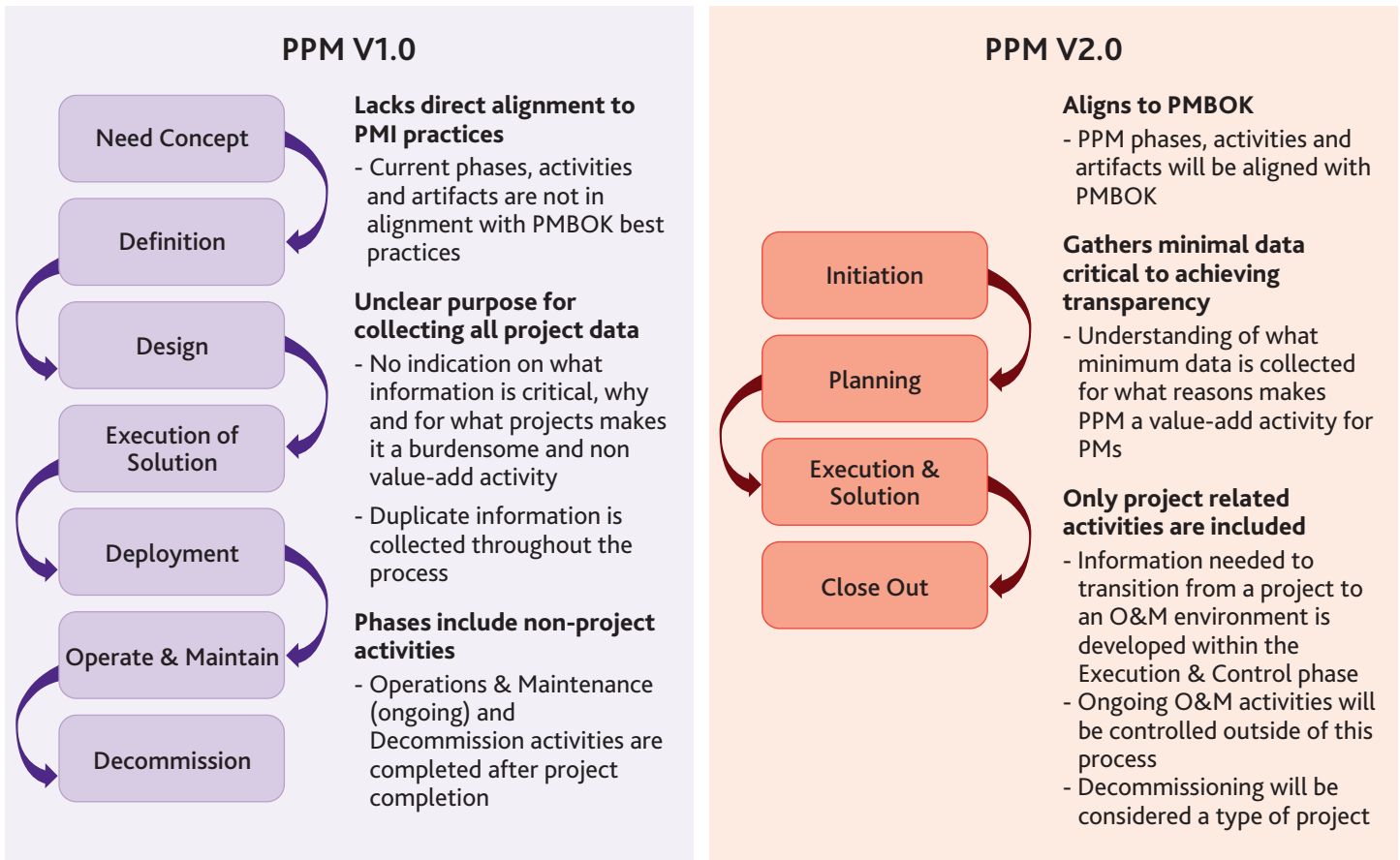
Figure 12: Knowledge/supporting areas across the portfolio, program, and project.

The *PMBOK® Guide* (PMI, 2013b) notes, “Projects and project management take place in an environment that is broader than that of the project itself” (p. 19). Part of that is the organizational lifecycle and governance process. It goes on to say, “Project governance is an oversight function that is aligned with the organization’s governance model and that encompasses the project life cycle. Project governance framework provides the project manager and team with structure, processes, decision-making models and tools for managing the project, while supporting and controlling the project for successful delivery” (p. 34).

Several agencies have used the *PMBOK® Guide* (PMI, 2013b) Process Groups as the lifecycle. The Department of Housing and Urban Development (HUD) recently migrated from traditional lifecycle, what they called PPM V1.0, to V2.0, which aligns with the *PMBOK® Guide* Process Groups as shown in **Figure 13**.

This is a great start, but the approach assumes that once a Process Group has passed some gate, as in a lifecycle, the process is completed, but processes are often repeated across a project lifecycle. The *PMBOK® Guide* (PMI, 2013b) notes, “[t]he Process Groups are not project life cycle phases. In fact, it is possible that all Process Groups could be conducted within a phase” (p. 52). It is recommended that organizations not use the Process Group names as the lifecycle phases so it is clear that the various processes in each group can be repeated again in each phase. Planning is the term that is most often misunderstood. Many Planning Process Group activities need to be repeated in what HUD calls the Execution & Control phase. Similarly, the Monitoring and Controlling Process Group activities would be needed in the planning phase of a project lifecycle, especially if that phase took 9 to 18 months, which is common in even relatively small federal efforts.

The PMBOK® Guide (PMI, 2013b), section 2.4, Project Life Cycle, states, “A project life cycle is the series of phases that a project passes through from its initiation to its closure. ... The phases can be broken down by functional or partial objective, intermediate results or deliverables, specific milestone within the overall scope of work, or financial availability. Phases are generally time bounded, with a start and ending or control point” (p. 38).



Source: http://portal.hud.gov/hudportal/HUD?src=/program_offices/cio/ppm

Figure 13: Department of Housing and Urban Development’s lifecycle—past and present.

Next Steps

As a federal agency leader or senior manager in the capital investment process, it is not necessary to wait for new laws, revised OMB policy, or updated agency procedures. None of that is needed to overlay a PMI OPM framework into the environment. Improvements can be obtained by adopting PMI's OPM framework: organizational strategy–portfolio–program–project, which uses the disciplined, good practices delineated in the related standards. Many agencies have started down this path, but to gain the maximum benefit, the OPM framework should be adopted with a portfolio breakdown structure. Standard artifacts, such as portfolio strategic plans, roadmaps, charters, and so forth, can be leveraged across portfolios and agencies. The approach also allows for utilization of PMI certifications and credentials both within the agency as well as with industry contractors and provides a baseline quality check on manager knowledge. Training companies can provide their PMI-based courses as the basis for the Federal Acquisition Certification for Project and Program Managers courses.

Confusion is very common; add in organizational dynamics, along with individual leader and manager personalities, and there exists a complexity that can bring a project to a standstill. Utilizing a common structure such as PMI's four tiers provides a robust framework with common language and activities that can provide clarity. PMI now has Project Management Professional (PMP)[®], Program Management Professional (PgPM)[®] and Portfolio Management Professional (PfMP)[®] credentials, thus adding a way to assure participants in the process have a fundamental knowledge of the framework. This would also help with federal employees and the supporting contractors who often work across agencies.

As U.S. federal agencies continue to use PMI standards, and federal acquisition leaders and managers with their industry counterparts obtain PgMP[®] and PfPM[®] credentials, momentum will accelerate and inter-agency benefits of using an industry standard will increase. An appropriate next step for OMB would be to re-write the CPG in alignment with the PMI standards. With that accomplished, OMB could participate with the integration across industry standards such as the ongoing collaborative work of PMI and INCOSE, the International Council on Systems Engineering. Before long, a systems approach to capital investment, whether in the federal government or in industry, will be common practice.

Notes

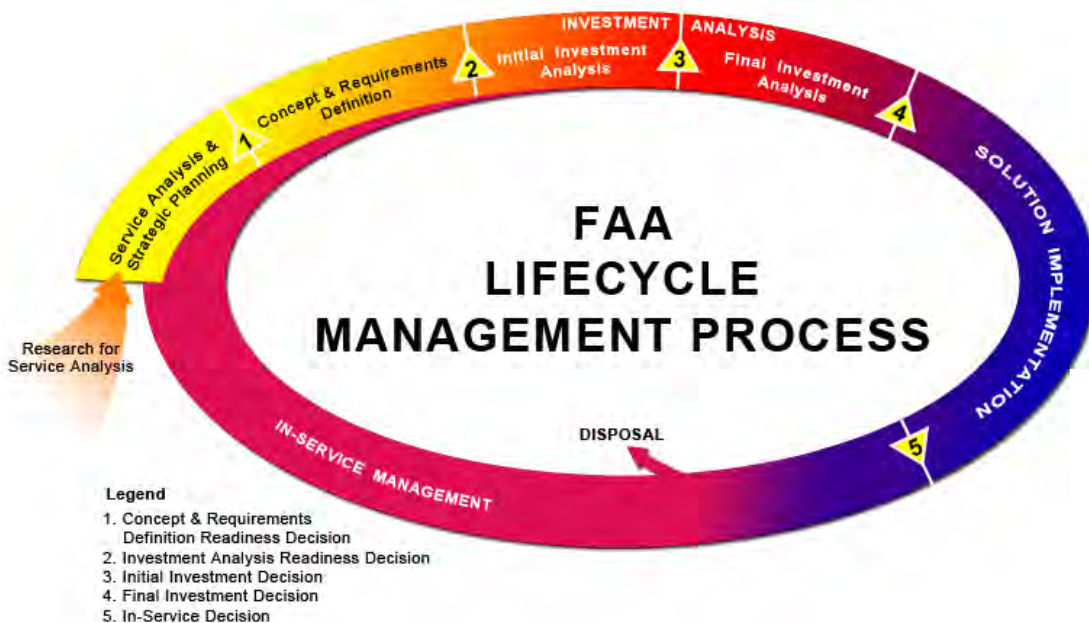
1. [^] ^ *The PMBOK® Guide* (PMI, 2013b) defines a methodology as “a system of practices, techniques, procedures and rules...” (p. 546).
2. [^] ^ Positive-oriented refers to leaders who focus on working within the system (positive) versus trying to fight the system (negative).
3. [^] ^ In this paper, the term program will appear in all capitals when referring to the agency mission as opposed to discrete efforts as a component of a portfolio of programs and projects.
4. [^] ^ In PMI standards, the portfolio manager would have responsibility for these activities.
5. [^] ^ It should be noted that the CPG Lifecycle is better aligned with the Process Groups and should be seen as such, not as a lifecycle that is used in a governance schema.
6. [^] ^ These roles are laid out in Part 6 of A-11.

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Appendix: FAA Example

Consider the Federal Aviation Administration’s Automatic Dependent Surveillance-Broadcast (ADS-B) investment run by the Surveillance Broadcast System (SBS) program office (<https://itdashboard.gov/investment/exhibit300/pdf/021-142305975>). This investment is a multi-billion dollar effort that has been broken up into several major segments. The investment is part of the National Aerospace System (NAS is currently going through a major upgrade, which FAA calls NextGen or Next Generation). Is the SBS Program Office running a project(s), program(s) or a portfolio? In a PMI structure, it is likely a portfolio that is part of the overall FAA NAS system. Within that portfolio there exist several portfolios, programs and projects. There could be the various segments into which the ADS-B investment has been broken. Each segment is proceeding separately through the FAA Lifecycle Management Process as shown in **Figure 14**. Note that the FAA Lifecycle is not the lifecycle outlined in the CPG. For the most part, all federal agencies tailor the lifecycle by expanding it. In the case of the FAA, they have expanded the plan/budget phase into two separate phases that are broken up by distinct governance gates. These segments, if they are programs, are further broken up into projects. The ADS-B 300 business case (also known as a 300 exhibit, see web link above) posted the summer of 2014 represents the second segment of investment and lists 15 separate projects in the Table II.B-1. Once the multi-tier structure is recognized, it is clear that it is impossible to manage ADS-B using only the CPG implied two-tier structure or just *PMBOK® Guide’s* (PMI, 2013b) Process Groups. PMI program and portfolio level activities need to be performed and multiple lifecycles will be ongoing in parallel paths. This is common in federal system acquisition management.



Source: <http://fast.faa.gov/>

Figure 14: Federal Aviation Administration’s lifecycle management process.

Is the SBS program office responsible for all of these activities? Are they accomplishing the various projects, programs, and portfolio processes for the various projects, programs and portfolios? If not, then who in the other parts of the FAA organization have responsibility? OMB (2014) A-11/CPG calls for the integrated project team to help the project manager with the management of the project. In reality, the integrated project team is really many teams in a tiered structure that cuts across numerous parts of the organization.

The SBS program office has been very successful and has implemented many of the framework concepts outlined in the PMI standards, partly by implementing an earned value management system across the whole management team, covering portfolio, program and project activities. In 2008, the GAO audited the effort and determined it was fully compliant (GAO-098-756). This is a great example of how an effort within an agency can build a comprehensive structure, and implement and conduct performance measurements against it.

Glossary of Abbreviations

ACP	Agency Capital Plan
ADS-B	Automatic Dependent Surveillance-Broadcast
CPG	Capital Programming Guide
DoD	Department of Defense
ERC	Executive Review Committee
GAO	Government Accountability Office
HUD	Housing and Urban Development
IPPD	Integrated Project and Process Development
IPT	Integrated Project Team
NAS	National Aerospace System
NASA	National Aeronautics and Space Administration
OMB	Office of Management and Budget
PfMP®	Portfolio Management Professional credential
PgMP®	Program Management Professional credential
PMI®	Project Management Institute
PMP®	Project Management Professional credential
SBS	Surveillance Broadcast System

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