Recommendation 38: Implement best practices for portfolio management.

Problem

In *both Volume 2* and *Volume 3* of the *Final Report*, the Section 809 Panel recommends DoD transition from program-centric to capability portfolio-centric acquisition management. Although implementation of a capability portfolio management framework is a best practice in itself, recognizing that the transition to portfolio management will not come easily nor without risk the best practices described below are put forth to help advance the transition and improve outcomes. Recommendations 36 and 37 provide detailed rationale for portfolio management and outline implementation actions to transition to a capability portfolio management framework for acquisition and sustainment of weapon systems. This recommendation identifies several specific approaches (creating critical questions, leveraging data, using analytical strategy modeling, and empowering the workforce) that serve as portfolio management best practices and would improve the likelihood of a positive transition to a multitiered portfolio framework that enables integration of requirements, budget, and acquisition/sustainment with decentralized decision authority.

The changes to acquisition and sustainment in Recommendations 36 and 37 are not totally unfamiliar to some aspects of DoD, but the key characteristics of portfolio management addressed within these recommendations have never been implemented as a comprehensive framework across DoD. The challenge is abandoning the deeply ingrained, stove-piped, program-based decision processes and procedures to adopt a new paradigm, while continuing to accomplish weapon systems development, testing, fielding, and sustainment. DoD, including OSD, JCS, Military Services and Defense Agencies have, over the decades, organized various collections of like capabilities into portfolios. An infrastructure for capability portfolio management exists in the Military Services and Defense Agencies with PEOs who already supervise, if not manage, capability portfolios.

In 2008 DoDD 7045.20 was signed directing DoD "to use capability portfolio management to advise the Deputy Secretary of Defense and the Heads of the DoD Components on how to optimize capability investments across the defense enterprise (both materiel and non-materiel) and minimize risk in meeting the Department's capability needs in support of strategy." Recommended implementation approaches, including enhancing PEO/PAE authority, establishing ECPs, rescinding both 5000.01 and DoDD 7045.20, and reissuing DoDD 5000.01 as the Defense Capabilities Acquisition and Sustainment Framework (DCASF), require commitment and leadership. Those activities, however, offer critical improvements to timeliness, flexibility, affordability, and technological innovation for weapon systems investments. It addresses and removes major challenges of the decades-old processes and procedures by focusing on managing by portfolio instead of program; by integrating requirements, budget, and acquisition/sustainment; and by delegating authority.

Background

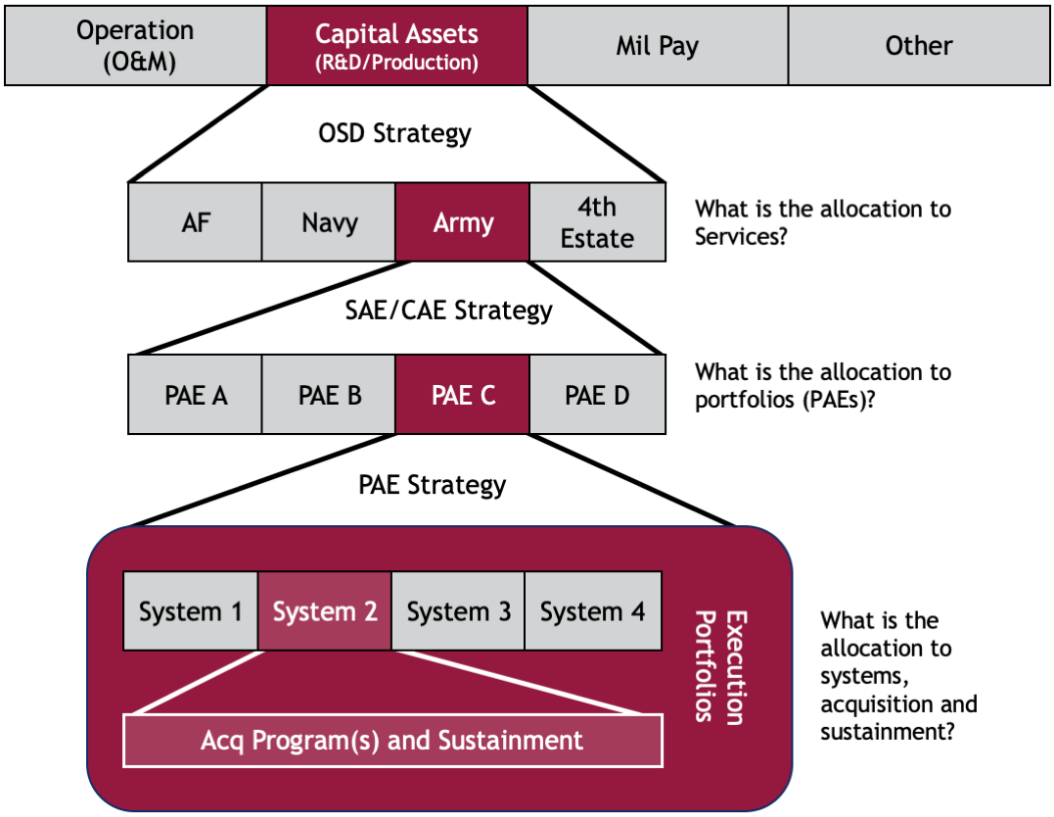
Currently, the USD(P) coordinates two strategic plans that are developed within the planning phase of PPBE—the NSS and the NDS.[1] Subsequently, D/CAPE publishes fiscal guidance and DoD reprogramming guidance in coordination with the DoD Comptroller. More than 10 years ago, DoDD 7045.20 called for CPM strategies and alignment of PEs (the structure for funding) to these portfolios; however, no substantial changes to the program approach have materialized.

The current DSS structure—comprising JCIDS, PPBE, and DAS—is not well suited for portfolio-based management because integration across DSS for capital assets occurs through formal, designated acquisition programs. These programs are either MDAPs or nonmajor programs (non-MDAPS). DoD groups many, but not all, of these programs into portfolios managed by PEOs. Although PEOs were created in the 1990s to align programs into portfolios, the DSS process maintained a program-centric view. PEOs were not assigned any additional duties in statute or DoDD 5000.01 to accomplish portfolio management. Instead, they are midlevel managers between the PM and Component or OSD MDA. Often, though not always, non-MDAP programs have MDA delegated to PEOs by SAEs.

During the past 20 years, portfolio management has become widely accepted by industry as a best practice and has proven to offer many benefits. Organizations tend to perform best with centralized strategy and decentralized execution. The evolving industry methodology for managing capital assets in portfolios has shown increased efficiency and effectiveness "as portfolio management is the bridge between strategy and execution."[2] The Section 809 Panel's recommendations regarding migration to a portfolio-based acquisition system move defense acquisition in this direction by establishing clear portfolio allocations from OSD to Military Services, then on to PAEs and PMs (see Figure 2-7). This decentralized structure both improves innovation and requires more coordination.

[1] The Planning, Programming, Budgeting, and Execution (PPBE) Process, DoDD 7045.14 (2017).
[2] Charles R. Mahon and John D. Driessnack, *Winning in the 21st Century: An Acquisition Point Paper to the Section 809 Panel,* September 2017, accessed June 7, 2018, https://www.pmi.org/-/media/pmi/documents/public/pdf/white-papers/command- negation.pdf.

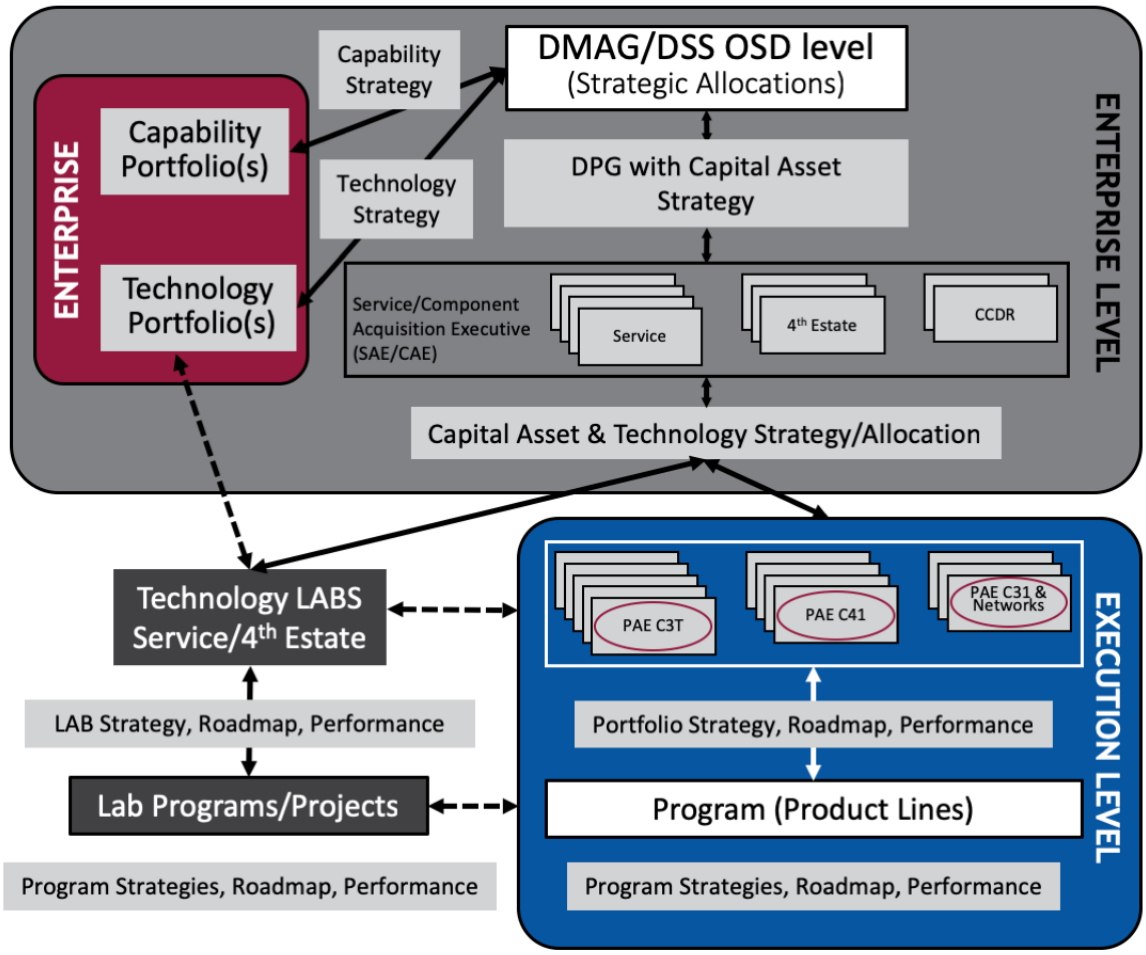
Figure 2-7. Portfolio Allocation



Industry guidance on project, program, and portfolio management has evolved since the 1960s, reflected in guidance published by the American National Standards Institute and the International Organization for Standardization.[3] Many countries, including the United States, have adopted these evolving industry standards. OMB Circular A-11 and A-119 both encourage agencies to embrace industry standards.[4] To move to a portfolio management approach in the management of capital asset projects and programs, DoD should transition to a portfolio governance model that aligns strategy, risk tolerance, resource capacity, and evaluation results. Doing so would add an integrated, tiered capital asset view (OSD to Military Service to execution portfolio to program) across DSS with enterprise-level capability views cross-cutting the Military Service-oriented view. The enterprise and execution views form the multitiered portfolio management system (see Figure 2-8).

[3] "The Standard for Portfolio Management, ANSI/PMI 08-003-2017," and "Guidance on Portfolio Management, ISO 21504:2015," International Organization for Standardization, accessed November 15, 2018, https://www.iso.org/standard/61518.html.
[4] Charles R. Mahon and John D. Driessnack, *Winning in the 21st Century: An Acquisition Point Paper to the Section 809 Panel,* September 2017, accessed June 7, 2018, https://www.pmi.org/-/media/pmi/documents/public/pdf/white-papers/command- negation.pdf.

Figure 2-8. Multitiered Portfolio Management System



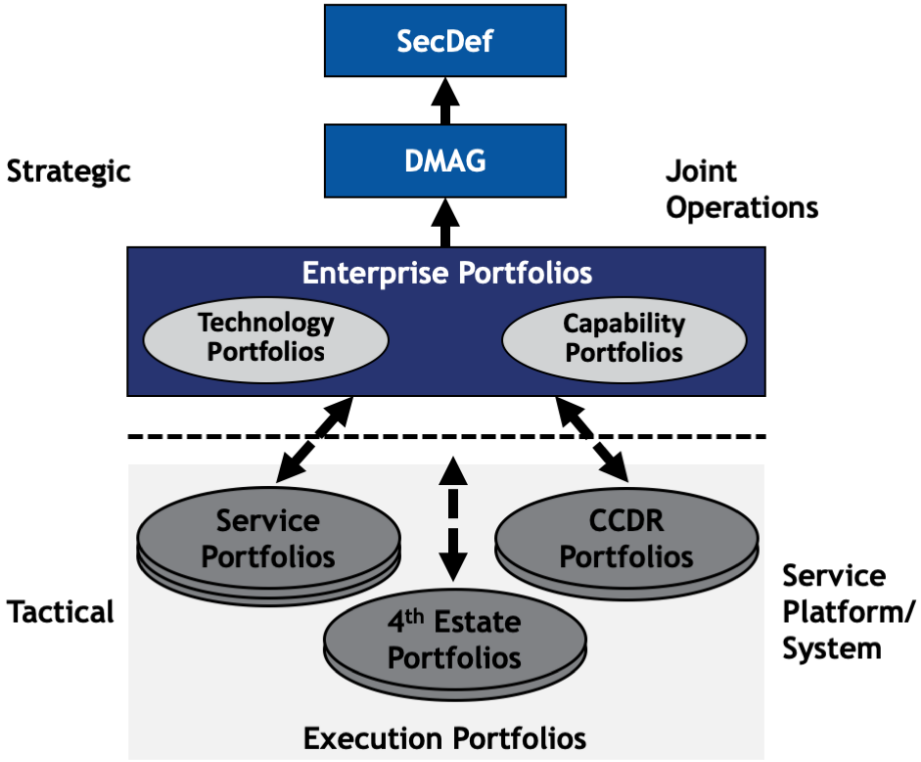
The ECP colead would provide senior decision makers views to resource allocation that would align objectives, capacity, and risk tolerance with execution portfolios managed by empowered and appropriately resourced PAEs. The PAEs could then optimize within their allocations down to PMs who have a lifecycle baseline (for both acquisition and sustainment).

Discussion

Taking a Portfolio View of Capital Asset Management

In its *Volume 2 Report*, the Section 809 Panel advocated for shifting from a program-centric DAS to one cemented around portfolio capabilities, with corresponding tools and resources that will support more effective program management. CPM would enable analysis and integration of cross-cutting data and create an enterprise view that would support better-informed decision making. This approach would provide new perspectives at both the strategic and tactical levels. The strategic enterprise level could view portfolios based on technology or capability. At the tactical execution level, portfolios would be viewed based on their organization (see Figure 2-9). In this model, the capability and execution views are tiered from the OSD to the Military Services and to the PAE. To maximize the ability of these new perspectives to enhance decision making in a portfolio-centric system, there are several best practices that should be considered.

Figure 2-9. Service Execution Portfolio and Enterprise Portfolio Information Flow



Moving from program-centric to portfolio-centric acquisition requires changing the primary view of how capital assets are managed. Portfolio management requires active management of the collection of programs/projects within the portfolio.[5] Portfolio management does not require a change in the overall federal approach for capital budgeting, but it does incorporate aggregated product lines or product mixes that facilities portfolio capability value assessments and resource allocation based on a broader capability view.

Industry portfolio management standards require portfolio-level strategic plans and roadmaps that enable strategic management. Included in these plans is value management, for which optimization is achieved by balancing benefits, risks, and resources. Additionally, a holistic, systems approach is needed given most portfolios are complex, adaptive systems.

Portfolio and program leaders should be transparent with the challenges (constraints, assumptions, issues, risks, and opportunities) within the portfolio of programs. The allocation to a portfolio and within a portfolio should be informed by the challenges. Points to consider include the following: W*hat is the challenge profile within the portfolio and the individual programs? Is the portfolio resilient enough to handle realized risks and lost opportunities that are historical within Defense Systems?* Armed with empowerment and flexibility in how resources are allocated, the PAE would craft a portfolio allocation that is robust enough to handle—at least in the near-term execution and budget years—cost, schedule,

[5] Ibid.

and performance variations that are inherent in defense systems. The portfolio team, with improved stability in resource allocations and mission capability, should be able to anticipate the level of variation in the near term given credible data and clarity on the challenges.

Creating Critical Questions on Portfolio Value

A single approach or model for portfolio management would not be successful, as the 50-plus PEOs today represent a broad range of capital assets with various definitions of what would constitute portfolio capability value. DoD, through the tiered enterprise-execution portfolio concepts, should tailor capability value modeling to inform decisions relative to resource allocations from OSD to Components to portfolios to programs. The models can assist with optimizing portfolio effectiveness of capabilities while balancing short-term needs with long-term capabilities, especially for weapon and combat-oriented information systems and product lines. Each portfolio needs to develop its own set of *critical questions on portfolio value* that drive not a business case, but a missions/capability value case that informs strategy.

OMB Circular A-11, Preparation, Submission, and Execution of the Budget, outlines direction for capital investment, budgeting, and management. Additional guidance is captured in the Capital Programming Guide (CPG) supplement to Circular A-11, which asks agencies to answer three *critical questions:*

- Does the investment in a major capital asset support core/priority mission functions that need to be performed by the federal government?
- Does the investment need to be undertaken by the requesting agency because no alternative private-sector or government source can better support the function?
- Does the investment support work processes that have been simplified or otherwise redesigned to reduce cost, improve effectiveness, and make maximum use of commercial off-the-shelf (COTS) technology?[6]

The CPG concept of having critical questions should be tailored to DoD. The recommended DoD enterprise- and execution-tiered approach necessitates tailored questions for each level of resource allocation. CPG, Section I.5.8, Portfolio Management, notes,

> *Capital assets should be compared against one another to create a prioritized portfolio of all major capital assets. … While the benefits and costs of capital asset portfolios should be quantified in monetary terms when feasible, agencies also measure return on the basis of outputs and outcomes. … Agencies should choose a portfolio of capital investment that maximize return to the taxpayer and the Government – at an acceptable level of risk.*

[6] Office of Management and Budget, *Capital Programming Guide, v3.0, Supplement to OMB Circular A-11: Planning, Budgeting and Acquisition of Capital Assets*, 2017, accessed November 9, 2018, https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/assets/a11_current_year/a11_2017/capital_programming_guide.pdf.

> *Portfolio management theory and standards are readily available from commercial sources and academic literature. The theory is not repeated here. Agencies are encouraged to focus on the practical application portfolio management theory. Most likely, the practical application will involve the tailoring of the principles to an agency's unique circumstances.*
>
> *All of the items in a portfolio must support strategic plans, goals, objectives and priorities. The strategy and goals drive the selection and prioritization. The selection process should eliminate unnecessary and poorly planned projects. In addition, the risks associated with each item should be evaluated and responses should be developed. The risk management process should reduce threats to the agency objectives. This should result in a portfolio that is balanced so that the mix of items maximizes the agency's ability to achieve strategic goals.* [7]

The U.S. Army PEO for Ground Combat Systems, which manages the portfolio of tanks and other ground-based fighting vehicles, provides an example of this type of portfolio strategic planning linked to prioritization across product lines. The PEO, having the challenge of budget reductions, developed a tailored portfolio-level model (CPAT), to determine the optimal investment strategy for ground combat modernization over the next 25–35 years.[8] The model demonstrates the type of portfolio-level analytics that can be used. The model has been subsequently used in more than 40 studies applying operations research methods to optimally prioritize investments across acquisition and sustainment challenges.

This type of capability value modeling—which is not just focused on efficiency, but also effectiveness given the constraints and assumptions for the portfolio—is becoming the norm within portfolio management best practices. A recent paper from Massachusetts Institute of Technology, *Program and Portfolio Affordability Tradeoffs Under Uncertainty Using Epoch-Era Analysis,* "introduces a method to conduct portfolio design for affordability by leveraging Epoch-Era Analysis [EEA] with aspects of Modern Portfolio Theory."[9] EEA "enables the conceptual design of systems that are resilient to potential change in context and needs (exogenous uncertainties) throughout the system lifecycle."[10]

Using Analytical Modeling of Strategy

An approach for addressing missions/capability is applying mission engineering approaches to map system capabilities to mission needs at the capability portfolio level. Mission engineering—which combines the structure of systems engineering with the tactical insights of operational planning—can provide a basis for assessing portfolio contributions to the delivery of capabilities against assigned kill chains and threads, understanding the effects of investment decisions on operational priorities, assessing the fighting capability of existing and planned weapon systems, identifying capability gaps in light of existing and planned acquisitions, and providing a common mission picture to senior leaders.

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[7] Ibid.
[8] Scott J. Davis et al., "Maximizing the US Army's Future Contribution to Global Security Using the Capability Portfolio Analysis Tool (CPAT)," *Informs Journal on Applied Analytics,* 46, no. 1 (2016): 91-108, https://doi.org/10.1287/inte.2015.0824.
[9] Parker D. Vasik, Adam M. Ross, and Donna H. Rhodes, "Program and Portfolio Affordability Tradeoffs Under Uncertainty Using Epoch-Era Analysis," *INCOSE International Symposium,* September 13, 2016.
[10] Ibid.

Mission engineering maps system capabilities to mission needs at the capability portfolio level.[11] Mission engineering emphasizes data-driven, capability-based assessments to produce integrated warfighting capabilities that can be translated into specific programmatic guidance for programs and can visually identify gaps.

Leveraging Data

The transition to portfolio management will allow program-level data to be leveraged and leaner as programs are managed within a portfolio structure. When appropriate, PAEs and functional leaders can reduce program-level instruction (DoDI 5000.02) and statutory documentation requirements through the use of portfolio approaches. Portfolio-level documentation should not be additive, but instead enable program-level documentation and reporting to be consolidated as appropriate. A holistic system approach to data and documentation should evolve with the goal of improved transparency. As portfolio management matures, the Select Acquisition Report (SAR) and Defense Acquisition Executive Summary (DAES) should transition to portfolio level.

Empowering Workforce

Prior to the Packard Commission, material and/or systems commands, which could best be described at the time as functional matrix organizations, held responsibility for acquisition and sustainment. One of the major findings of the Packard Commission was that individuals in the functional organization (today, often referred to as competencies) had decision authority on matters that affected a program's cost, performance, and/or schedule. Implementation of the Packard Commission's recommendations was an attempt to remedy this situation by better unifying programmatic decisional authority. The Packard Commission, and the advent of integrated program teams in the 1990s, shifted the balance of power in the direction of PMs and PEOs. In the intervening years, the influence PEOs and PMs has declined, as evidenced by the current situation in which process too often eclipses the mission of product development and delivery. Recommendations 36 and 37 in this report work to restore line management authority and rebalance the emphasis of product over process, in particular by designating the SAE/PAE as the top of the chain of command responsible for managing the system from initiation to disposal.

A prime reason processes have overpowered products has been the resistance of the functional competencies to colocate their personnel with program teams, especially within the contracting and comptroller competencies. To the maximum extent practicable, functional competency personnel should be colocated with PMs and PAEs. Functional competency personnel should support PMs and PAEs by doing the following:

- Providing competent, qualified personnel.
- Operating and sustaining efficient and effective infrastructure.
- Establishing consistent policies and technical guidelines.

[11] "Mission Engineering Integration and Interoperability (I&I)," James D. Moreland, Naval Sea Systems Command, accessed August 2, 2018, https://www.navsea.navy.mil/Home/Warfare-Centers/NSWC-Dahlgren/Dahlgren-Resources/Leading-Edge/I-I-Leading-Edge/Moreland/.

- Streamlining processes.
- Incorporating advanced technology and operating and support lessons into design.

Colocating competency personnel should include competencies charged with maintaining clearance certification (e.g., flight clearance and submarine safe) which must function as a check-and-balance to ensure safety and good functional practice. The purposeful tension between the PM's and PAE's directive authority, functional competencies, technical guidelines, and consistent policy charters should not impede progress. That tension is intended to further programmatic efficiency while maintaining standards and safety. When conflicts between the entities cannot be resolved, they must be expeditiously elevated to senior leadership for adjudication.

Although colocation would be quite helpful, it is not the only approach to help facilitate portfolio management. To actively manage portfolio challenges, PAEs need a more empowered workforce than most current PEOs have. For PAEs to be agile, the workforce also needs to be agile within the organization. Thus, the individuals assigned to the PAE execution organization by the enterprise, whether they are program managers, contracting officers, financial managers, system engineers, or other functional members, should be empowered by their system command or parent organization when assigned to the PAE organization. Individuals should be assigned, to the maximum extent practical, as full-time employees to PAE organizations, allowing PAEs and their senior acquisition functional matrix leaders the necessary agility in balancing resource needs. The workforce members assigned full time to the PAE organization should be rated within the PAE organization by their respective senor matrix leaders, who are also assigned full time. Senior matrix leaders should be rated by the PAE or deputy PAE as appropriate. Missile Defense Agency (MDA) provides a current example. In addition to overseeing the programs within the MDA portfolio, the MDA director, unlike most PEOs, has a more active management role in the portfolio, with increased contracting, financial systems engineering, and other functional authorities. Although rated by the PAE, common sense checks and balances are required for certain functional experts with specific decision-making authority of their own, such as warranted contracting officers. Such functional experts should have a concurrent rater within their specific functional area to support their independent decision-making role.

Conclusion

Moving defense acquisition from a highly centralized, program-centric model with stovepipe-driven requirements, budget, and acquisition processes to a collaborative, decentralized, portfolio-centric framework entails nothing more than implementing management best practices. The move would yield timely, flexible, agile, cost-effective, and technologically innovative weapon systems acquisition and sustainment. Portfolio management is no longer in its infancy; there are standards and best practices that DoD can use while implementing the recommended multitiered capability portfolio framework. DoD could start with using critical questions to drive a long-term portfolio investment strategy that supports meeting capability needs, implementing analytical modeling of strategy to apply mission engineering approaches to map system capabilities to mission needs at the capability portfolio level, leveraging data that allow the MDAs (DAE, SAE, PAE, PM) and functional leaders to reduce program level instruction (DoDI 5000.02) and statutory documentation requirements, and empowering the workforce to make decisions.

Creating Critical Questions on Portfolio Value

Portfolio managers need to devise *critical questions on portfolio value* that support development of capital-asset-focused strategies, roadmaps, and analytical models. The portfolio manager should ask critical question that cut across DSS to tease out strategies that drive an optimized portfolio. Each portfolio leader should establish a set of criteria that sets the key questions for determining portfolio capability value allocation decisions at each enterprise and execution portfolio tier. With more than 50 current PEOs migrated to being PAEs, the execution portfolios will cover a broad set of defense systems, and each portfolio would have a unique set of criteria to help determine for the portfolio what value means, allowing for tailored approaches.

Using Analytical Modeling of Strategy

All portfolio levels, whether OSD ECP portfolios or Military Service and PAE execution portfolios, need to use models to support allocation recommendations and decisions. All DoD-level ECPs should develop a 20-year capital asset strategy, aligned and linked to the NDS, which addresses their assigned functional capabilities. The goal of these strategies is to inform the discussion (through critical questions) on how defense resources should be allocated at the enterprise level across the services and execution portfolios to optimize capability in accordance with the NDS. Each strategy should focus on and recommend potential paths for changes to current Military Service and Defense Agency allocations relative to missions and resources with a focus on which changes have the best potential for an optimized capability across the next 20 years. The strategies should be supported by operations research (OR) modeling that considers both current and future (out to 20 years) capacity/mission planning needs.

Leveraging Data

Current program-oriented documentation can be transitioned to include a portfolio view to assist management and communication of the portfolio strategy and roadmap. Portfolio leadership should leverage and update current program-centric data sets to support creation of portfolio data sets and information needed to identify and document portfolio capability value decisions and allocations to portfolios/programs. A lean approach should be taken to consolidate the current program-centric planning/resource/reporting documentation to a more holistic system approach for portfolio-centric documentation. The portfolio strategy, roadmap, and periodic assessment reporting should provide transparency to stakeholders. Documentations, as appropriate, would be approved by negation. As portfolio strategies are created and overall portfolio management reporting matures, the program-oriented and DAES reporting would transition to a portfolio strategy annual and quarterly reporting.

Empowering Workforce

Workforce responsibility, authority, and accountability of the workforce should be fully aligned to the objectives of the PAE organizational mission. The operational chain of command runs from SAE to PAE (replaced PEO) to senior portfolio staff, including PMs and functional leaders. Senior functional leaders from the enterprise should be assigned full time to the portfolio organization and be rated in the portfolio organization on their contribution to successful achievement of the portfolio's objectives. Colocating competency personnel should include competencies charged with maintaining clearance certification (e.g., flight clearance and submarine safe), which must function as a check-and-balance system to ensure safety and good functional practice. Tension will occur between PM's and PAE's

directive authority and functional competencies. That tension is to further programmatic efficiency while maintaining standards and safety but needs to be elevated if it is affecting execution. The senior functional leaders within the PAE organization should also rate the full-time functional workforce assigned to the PAE as appropriate.

Implementation

Legislative Branch

- There are no statutory changes required for this recommendation.

Executive Branch

- Revise DoDD 5000.01, The Defense Acquisition System, as The Defense Capability Acquisitions and Sustainment Framework (a recommended draft is attached in the Implementation Details for this section) and incorporate applicable Section 809 Panel recommendations including the following

  - Implement best practices for portfolio management.

- Direct development of an implementing DoDI for the Defense Capability Acquisition and Sustainment Framework, which should include the following among other best practices:

  - Establish key questions for determining portfolio capability value relative to resources efficiency and effectiveness.
  - Use a combination of models to support resource allocation and capability delivery effectiveness decisions at each portfolio tier (PAE, Service, OSD).
  - Leverage and update current program-centric data set to support the creation of portfolio sets of data and information to document portfolio capability value and resource allocations to portfolios/programs. Aggressively lean documentation requirements. Address required reporting transition from program to portfolio as portfolio management matures.
  - Fully align responsibility, authority, and accountability of the workforce to the objectives of the PAE organizational mission. Delegate functional authority to individuals assigned to the PAE execution organization by the enterprise to execute the PAE organization's objectives. Rate these individual within the PAE organization on their contributions to the success of those objectives. Plan for tension between program and functional leadership that will positively affect outcomes so leaders learn to work together to achieve the PAE organizational mission objectives.

Implications for Other Agencies

- There are no cross-agency implications for this recommendation.