NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL PROJECT

GAP ANALYSIS OF DEPARTMENT OF DEFENSE PROGRAM MANAGEMENT COMPETENCY STANDARDS IN PREPARATION FOR THE SHIFT TO PORTFOLIO MANAGEMENT IN DEFENSE ACQUISITIONS

December 2021

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REPORT DOCUMENTATION PAGE			*Form Approved OMB No. 0704-0188*

1. AGENCY USE ONLY *(Leave blank)*	**2. REPORT DATE** December 2021	**3. REPORT TYPE AND DATES COVERED** MBA Professional Project

4. TITLE AND SUBTITLE
GAP ANALYSIS OF DEPARTMENT OF DEFENSE PROGRAM MANAGEMENT COMPETENCY STANDARDS IN PREPARATION FOR THE SHIFT TO PORTFOLIO MANAGEMENT IN DEFENSE ACQUISITIONS

5. FUNDING NUMBERS

6. AUTHOR(S) Conor W. Stewart, Adam T. Deitrich, and Jordan M. Reid

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Naval Postgraduate School
Monterey, CA 93943-5000

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
N/A

10. SPONSORING / MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

12a. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for public release. Distribution is unlimited.

12b. DISTRIBUTION CODE
A

13. ABSTRACT (maximum 200 words)

The purpose of this study is to perform a gap analysis on the existing Department of Defense (DOD) program management competency standards to determine if changes are required to fully adopt product portfolio management (PPM) strategies in defense acquisitions. We do this by comparing the current DOD standards to the Project Management Institute's Portfolio Management Professional certification standards. We ask where the gaps in the standards exist and where the standards align, and assign a Barrier to Implementation (BTI) score to each gap in the DOD standard. The study found that the DOD is on average 41% aligned with industry standards. In the higher weighted domains of Governance and Strategic Alignment, alignment percentages are significantly lower. The composite BTI score for the DOD is 1.45, indicating low to medium BTIs for most of the gaps. Results do not suggest that the DOD is incapable of conducting PPM, but rather that the current competency standards do not align with industry best practices. Defense acquisitions professionals should review our analysis and formulate Portfolio Management Career Field Functional Competencies to further professional standards, develop the necessary job skills and evaluation criteria, and further the process of achieving congressional mandates for portfolio management implementation.

14. SUBJECT TERMS acquisitions, portfolio management, competency standards	**15. NUMBER OF PAGES** 101
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	**18. SECURITY CLASSIFICATION OF THIS PAGE**	**19. SECURITY CLASSIFICATION OF ABSTRACT**	**20. LIMITATION OF ABSTRACT**
Unclassified	Unclassified	Unclassified	UU

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

from the

NAVAL POSTGRADUATE SCHOOL
December 2021

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ABSTRACT

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LIST OF ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
BTI	Barrier to Implementation
CAP	Critical Acquisition Position
CPM	Corporate Portfolio Management
DACM	Director of Acquisition Career Management
DAU	Defense Acquisition University
DAWIA	Defense Acquisition Workforce Improvement Act
DOD	Department of Defense
FY	Fiscal Year
GAO	Government Accountability Office
KLP	Key Leadership Positions
MDA	Milestone Decision Authority
MDAP	Major Defense Acquisitions Programs
NDAA	National Defense Authorization Act
OMB	Office of Management and Budget
OUS(A&S)	Office of the Under Secretary of Defense for Acquisition and Sustainment
PAE	Portfolio Acquisition Executive
PEO	Program Executive Office
PgMP	Program Management Professional
PfMP	Portfolio Management Professional
PM	Program Management
PMP	Project Management Professional
PMI	Project Management Institute
PPM	Product Portfolio Management
R&D	Research and Development
UOC	Units of Competency

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EXECUTIVE SUMMARY

The purpose of this study is to perform a gap analysis on the existing Department of Defense (DOD) program management (PM) competency standards to determine if changes are required to fully adopt product portfolio management (PPM) strategies in defense acquisitions. The National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2021 established PPM as the required management process for the acquisition of defense weapons systems to reduce cost and increase acquisitions efficiency (National Defense Authorization Act [NDAA], 2021). This shift requires analyzing defense acquisitions' existing PM competency standards to determine alignment with industry standards for PPM. The scope of this thesis is narrowed to the analysis of Defense Acquisition University (DAU, 2020) standards, titled *DOD Program Management Career Field Functional Competencies* and the Project Management Institute's (PMI) Portfolio Management Professional (PfMP) certification.

Research questions:

1. **Are there gaps in the DOD PM competency standards that must be addressed before the DOD can fully implement PPM as directed in the NDAA of 2021?**
2. **Where are the DOD and PMI aligned regarding competency standards?**
3. **What barriers exist regarding the implementation of national standards?**

The methods used to answer the research questions include qualitative and quantitative analysis of DAU standards and the PMI PfMP certification using PMI's five performance domains of Strategic Alignment, Governance, Portfolio Performance, Portfolio Risk Management, and Communication Management. We based our assessment of alignment on the following criteria:

- ***No Discernible Alignment*** indicated that no current DOD PM competency standard fit the description of a PMI-stated task and received an alignment score of 0.

- ***Partial Alignment*** indicated that one or more keywords or the general purpose of the DOD PM competency or sub-competencies are related to the PMI task and received an alignment score of 0.5.

- ***Full Alignment*** indicated that an existing DOD PM competency standard matched the PMI stated task to the degree that included several exact word matches or clearly aligned descriptions, purposes, or applications and received an alignment score of 1.

The comparison results show that the three most heavily weighted domains—Strategic Alignment, Portfolio Performance, and Governance—exhibit the three lowest alignment percentages of the five domains. The remaining two domains—Portfolio Risk Management and Communications Management—exhibit the highest alignment but are the least heavily weighted domains in the PfMP certification exam. This observation is significant because the weights from the exam represent the importance of the domain when evaluating competency as displayed in Table 1.

Table 1. Raw and Weighted Alignment Scores.

Domain	Alignment Score	Exam Weight
Strategic Alignment	19%	25%
Governance	0%	20%
Portfolio Performance	35%	25%
Portfolio Risk Management	50%	15%
Communications Management	100%	15%
Average Alignment	**41%**	**36%**

The most significant gaps are in the domain of Governance. Implementing PfMP standards requires significant restructuring and updated policy to codify roles and responsibilities in this domain. Additionally, while the current construct accounts for authoritative thresholds, risk tolerance levels, key performance indicators, prioritization models, and escalation procedures, the infrastructure does not exist at the portfolio level within the DOD. Instead, it is siloed in individual programs. Moreover, since many of these topics deal with funding at the congressional level, change will be difficult.

The second domain in which the DOD has significant gaps in their PPM standards is in Strategic Alignment. This section of the PfMP standard calls for leaders to make and evaluate organizational goals and marry them to portfolios. Since the structure, protocols, and procedures for effective PPM do not currently exist at the portfolio level within the DOD, a cohesive strategy cannot be enacted (Project Management Institute [PMI], 2013).

After examining alignment between DOD and PMI competency standards, we assessed each gap based on perceived barriers to implementation (BTI). The assessed barriers signal to defense acquisitions decision-makers the areas where implementation will be the most challenging and are noted in Figure 1. We based our BTI assessment on the following criteria:

- ***No BTI*** is defined as practices that already occur within the DOD and received an implementation score of 0.
- ***Low BTI*** signifies changes that the DOD could implement immediately with little to no change in personnel structure or additional policy concerns and received an implementation score of 1.
- ***Medium BTI*** requires either significant policy or personnel structure changes and received an implementation score of 2.
- ***High BTI*** requires both significant personnel and policy changes and received an implementation score of 3.

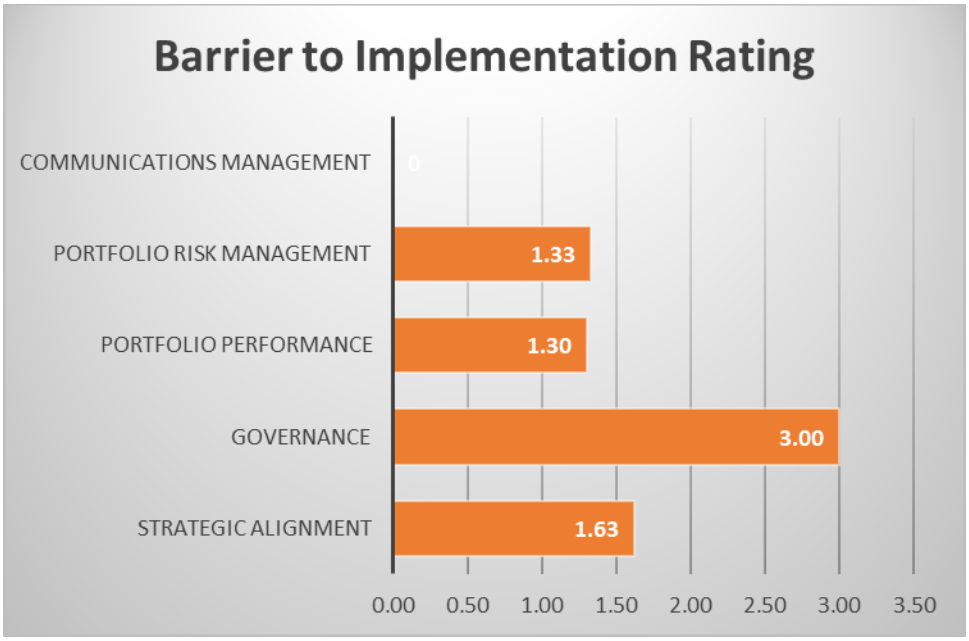

Figure 1. BTI Breakdown by PfMP Domain.

The composite BTI score is 1.45, reflecting a low to medium BTI level for most gaps discovered in the DOD standard. This score indicates that many of the skills contained in the DOD PM standards are transferrable to the portfolio management model with few modifications. However, Governance received a BTI rating of 3.0—all tasks in this domain classify as a high BTI. Currently, DOD personnel structures, policies, and procedures are set for a program-centric governance model. The DOD will need to modify personnel structure, governance policies, and associated procedures towards a portfolio-centric structure to transition to a PPM strategy. Changes in Governance will enable changes across all domains.

Our results do not suggest that the DOD is incapable of conducting portfolio management. Instead, in conducting portfolio management, the DOD relies on PM competency standards that do not align with industry best practices and are based on a fundamentally different strategy. The defense acquisitions system is not currently structured to provide the appropriate training, education, and feedback for proper job performance within a portfolio management-centric strategy. We recommend defense acquisitions professionals and policy-makers review our analysis and formulate Portfolio

Management Career Field Functional Competencies to further DOD professional standards, develop the necessary job skills and evaluation criteria, and further the process of achieving congressional mandates for portfolio management implementation. We see the establishment of PPM competencies, based on proven industry standards, as a vital component to the successful implementation of congressional mandates to move towards a portfolio management-centric acquisitions strategy. The potential success of any policy changes will hinge on the individual and collective competencies of the acquisitions professionals charged with executing them.

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ACKNOWLEDGMENTS

We would like to thank our spouses and families for their continued and unwavering support throughout our time at Naval Postgraduate School. We would like to thank our advisors, Raymond Jones and Dr. Robert Mortlock, for their guidance and understanding while also providing a wealth of knowledge on defense acquisitions and a necessary sounding board. Finally, we would like to thank the Acquisition Research Program for their sponsorship, support, and assistance in conducting and completing this project.

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I. INTRODUCTION

The National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2021 recently established portfolio management as the required management process for the acquisition of defense weapons systems to reduce cost and increase acquisitions efficiency (National Defense Authorization Act [NDAA], 2021). This is a significant shift from the current strategy of program management (PM). The one potentially substantial problem may be that defense acquisitions' existing project management competency standards do not align with product portfolio management (PPM) or the overall construct of corporate portfolio management (CPM). The purpose of this study is to perform a gap analysis on the existing Department of Defense (DOD) PM competency standards to determine if changes are required to fully adopt PPM strategies as outlined by the NDAA, the Section 809 Panel, and the Government Accountability Office (GAO).

A. BACKGROUND

The FY2021 NDAA establishes portfolio management as a requirement for DOD acquisitions, with full implementation expected by 2023. Additionally, the FY2021 NDAA orders the secretary of defense to implement a "third-party accredited [certification] program based on national or international recognized standards" (NDAA, 2021, p. 318) for all acquisition career fields. Currently, the Directors of Acquisition Career Management (DACMs) and the Defense Acquisition University (DAU), which act as the DOD's acquisition training arm, do not recognize portfolio manager as a career field separate from PM, creating a potential gap between the competency standards and the requirement for portfolio management.

While organizations such as the Section 809 Panel, the Office of Management and Budget (OMB), and the GAO have been advocating for PPM for 20 years, change has been slow to come (Ahern & Driessnack, 2019; Government Accountability Office [GAO], 2015). In the corporate world, when an organization shifts from a program-centric acquisitions strategy to a PPM strategy, it stems from two drivers: the need to make rational investment decisions that deliver organizational benefits and the need to optimize resources

to ensure the efficient delivery of those benefits (Young & Conboy, 2013). PPM achieves these benefits by pooling resources and analyzing how decisions made about one product affect the other products in the portfolio and portfolio priorities writ large. This is not how defense acquisitions currently operate. Additionally, the defense acquisitions enterprise comprises numerous commands with their own goals, agendas, and interpretations of policies (GAO, 2020). These organizations change leaders and priorities every 3 or 4 years. This "fragmented adhocracy" makes implementing change difficult (Young & Conboy, 2013, p. 1090). Last, implementing PPM will require competent professionals. According to Young and Conboy (2013), competence is "the ability to do something well" (p. 1091). PPM requires a common competency standard as the metric to train and evaluate acquisition professionals correctly. Identifying gaps in the competency standards is the first step to updating and codifying a standard that can be used as a common thread to synchronize efforts across the acquisitions enterprise.

Within the DOD, significant knowledge gaps are preventing the full implementation of PPM. One reason for the absence of standards related to PPM is a lack of clarity. In the academic community and industry, there has been confusion as to what constitutes PPM. The term often gets used interchangeably with PM, project management, and multi-project management (Young & Conboy, 2013). In part, DOD PPM standards have not been created or implemented because of a lack of theoretical glue. Historically, from the Corporate Portfolio Management (CPM) perspective, CPM practices and procedures have been undervalued and under-researched, leading to an identified gap between the direction and means available to implement CPM. Despite many medium and large corporations applying high degrees of relevance to CPM and their reliance on CPM tools to make strategic decisions, "Academic research has not kept up with the realities and needs of the corporate world" (Nippa et al., 2011, p. 64). The lack of CPM-focused research, combined with the statutory requirement to implement portfolio management, presents a need to conduct focused CPM research to recognize and improve CPM's value. While related topics have been researched, CPM has been neglected in part due to the emergence of, and focus on, value-based models and criticisms of CPM practices and tools (Nippa et al., 2011). Much of the body of previous research underestimates the importance

of corporate diversification, oversimplifies CPM, and criticizes its application without consideration of empirical evidence to the contrary (Nippa et al., 2011).

B. PURPOSE

The purpose of this study is to perform a gap analysis on the existing DOD PM competency standards to determine if changes are required to fully adopt PPM strategies as outlined by the NDAA, the Section 809 Panel, and the GAO.

1. Research Questions

Our research questions are

1. **Are there gaps in the DOD PM competency standards that must be addressed before the DOD can fully implement PPM as directed in the NDAA of 2021?**
2. **Where are the DOD and Project Management Institute (PMI) aligned regarding competency standards?**
3. **What barriers exist regarding the implementation of national standards?**

2. Benefits of This Study

The study benefits the defense acquisition community in a multitude of ways. First, the study assesses the current *alignment* of DOD standards to PMI standards and highlights the most significant gaps in DOD competency standards. Next, it highlights areas that have the lowest barriers for PMI standard implementation. Last, it serves as a foundation for developing updated professional standards for use in the DOD based on accredited national and international standards as mandated in the FY2020 NDAA (NDAA, 2019).

C. SCOPE

The scope of this thesis is narrowed to the analysis of the competency standards required for acquisitions professionals and the potential application of new standards to encompass portfolio management. The study of current internationally accepted industry

standards is included for determining their applicability to the DOD acquisitions process and associated competency standards. While there are structural, budgetary, statutory, and design implications to the shift from program-centric to portfolio management, those items are not covered by this thesis topic. They are found in the recommendations for further research.

D. METHODOLOGY

To conduct this study, we first completed a thorough review of the literature. The analysis included a 4-month review of peer-reviewed journals, government reports, DAU material, PMI material, and other vital sources. After the literature review, we selected the PMI competency standard as the base document for DOD PM competency standards gap analysis. Other standards were either obsolete or based on the PMI standard.

We then created a spreadsheet that enabled the comparison of the PMI standards across five performance domains with the DOD competency standards from the DAU website. DOD standards were matched with PMI standards qualitatively by first searching for keywords or phrases to determine alignment. Karnes's (2020) lexicographic analysis of the DOD's PM competencies informed our comparison. His study outlined the alignment of DOD PM competencies with project, program, and portfolio standards using red, yellow, and green colored charts.

After aligning the competencies where applicable, we used the qualitative data to find alignment, identify gaps in DOD standards, and provide recommendations on updating the DOD standards to facilitate the DOD transition to portfolio management. We explored these gaps in detail for each of the five testable PMI performance domains for portfolio management.

Once we identified all the gaps in the DOD standard, we separated them into three different categories based on barriers to implementation (BTI). We assessed an average BTI rating for each performance domain, as well as a composite BTI rating. Those with *No BTI* are defined as practices that already occur within the DOD and received an implementation score of 0. Those with *Low BTI* signify changes that the DOD could implement immediately with little to no change in personnel structure or additional policy

concerns and received an implementation score of 1. Those with *Medium BTI* require significant policy or personnel structure changes and received an implementation score of 2. Those with *High BTI* require significant personnel and policy changes and received an implementation score of 3.

E. ORGANIZATION OF STUDY

In Chapter II, we present a literature review on the concept of PPM and background on the history of the transition from PM to PPM in defense acquisitions. Furthermore, we explain the current DOD competency standards implemented by the DAU and competency theory in general. We conclude the literature review by reviewing the PMI's PPM competency standards and curriculum for certification.

In Chapter III, we discuss the qualitative and quantitative methodologies used to complete the study. This chapter outlines the steps taken to achieve our gap analysis and explains how we determined *alignment*. The section also describes how we determined which gaps were classified as *No BTI*, *Low BTI*, *Medium BTI*, or *High BTI*.

Chapter IV presents the gap analysis results. The results highlight the criteria missing from the DOD competency standards that may prevent PPM implementation as directed by the FY2021 NDAA. We present these findings broken down by PMI Portfolio Management Professional (PfMP) performance area. We provide further analysis on which competency standards could be immediately implemented in defense acquisitions and those with medium and high BTI.

In Chapter V, we provide definitive answers to our research questions. Moreover, we discuss the utility of the study and the limitations of the research. We conclude the chapter by discussing recommendations for future research.

F. SUMMARY

The shift from program to portfolio management is a significant endeavor for the DOD that requires analysis of existing competency standards to determine the applicability of the existing standards and the requirement for developing new standards. Applying nationally accepted industry standards to portfolio management competencies in the DOD

may be a vital component to improving the acquisition system and meeting the FY2020 and FY2021 NDAA requirements.

II. LITERATURE REVIEW

The literature review provides a baseline presentation of current initiatives, definitions, certifications, and program and portfolio management competency standards. The focal points of the literature review include a review of PPM and historical context for the transition from PM to portfolio management in DOD acquisitions, including reports produced by the Section 809 Panel, the DAU competency standards, and PMI products, certifications, and literature. The intent of this literature review is to understand the current state as well as applicable directives and initiatives concerning competency standards and certifications used in program and portfolio management.

A. PRODUCT PORTFOLIO MANAGEMENT

Portfolio management is an approach that commercial companies use to optimize investments (GAO, 2015). It starts with understanding customers' needs and desires and then prioritizes acquisition opportunities while accounting for resource constraints. Once the opportunities are prioritized, personnel can draft initial business cases to meet those needs. Each business case goes through a gated process where it is "assessed against others in the portfolio" (GAO, 2015, p. 5). Resources, established criteria, competing products, and the organization's strategic goals are all considered during the assessment. This process continues "until only those alternatives with the greatest potential to succeed" are added to the product portfolio (GAO, 2015, p. 5). Therefore, the DOD would only create new programs through a holistic portfolio analysis process (GAO, 2015).

A portfolio management strategy improves the defense acquisitions procedure in three significant ways. First, it requires acquisition professionals to assess investments collectively at the enterprise and component level rather than as independent initiatives at the service level. Second, it uses "an integrated approach to prioritize needs and allocate resources" to align with strategic goals (GAO, 2015, p. 7). Last, it empowers leaders to make investment decisions and provides a mechanism to hold them accountable for the outcome (Section 809 Panel, 2019a).

Under this construct, program executive officers (PEOs) would be replaced with portfolio acquisition executives (PAEs). These PAEs would be delegated Milestone Decision Authority (MDA) in most cases. Instead of being funded to manage a single program, they would create a road map, draft a budget, and receive funding for their portfolio. Using the gated process to receive guidance from strategic decision-makers, the PAE would shift funding, timelines, and other priorities within their portfolio to meet customer needs and strategic goals. They would also be responsible for ensuring interoperability, managing the entire life cycle, and working with the research and development (R&D) community regarding prototyping and experimentation (Section 809 Panel, 2019a).

Current defense acquisitions procedures measure success through cost, schedule, and performance metrics for individual programs with acquisition program baselines. However, these measurements do not allow program managers to develop optimal solutions across a range of capabilities and customer needs. Therefore, at times they can be detrimental to the larger, strategic mission. Additionally, they provide little insight into the value the program offers to the customer. Last, they do not allow flexibility because they incentivize stability and avoiding new requirements. Instead, PAEs and portfolios should be judged on things such as "customer satisfaction, user acceptance or reject rates, user productivity improvements, mission effectiveness enhancements, and many others that relate to value and return on investment" (Shultz, 2020, p. 47). Additionally, there must be a mechanism to measure the success of things such as rapid prototyping. These may include metrics such as "time to deliver knowledge points, cycle time to build virtual prototypes, number of failures and lessons learned, and time to mature prototypes into fieldable capabilities" (Shultz, 2020, p. 47).

Defining what PPM is and what it is not, is of particular importance in the DOD because the terms *program*, *portfolio*, and *projec*t are often used interchangeably by defense acquisition professionals at all levels. PMI defines a portfolio as "a collection of projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives" (PMI, 2017b, p. 6). While the first part of this definition is easily understood, the second half can generate confusion. A portfolio is a way to hedge against

risk by pooling resources. Hence, a portfolio must be made with a clear strategy and priorities that the manager can use to make decisions. If portfolio managers are given a set of missions or capabilities they must meet, they can then analyze the assets and programs within the portfolio available to fulfill that mission. The manager can then identify gaps in the portfolio where the DOD must allocate resources. These gaps inform how funding, personnel, and R&D should be allocated, all while keeping within the overarching strategy of the portfolio. Portfolio managers are not overly invested in the success or failure of any particular project or program but instead focus on how individual programs are performing holistically within the portfolio (PMI, 2017b). Success is determined based on "aggregate investment performance and benefits realization of the portfolio" (PMI, 2017b, p. 6). While in business, a company may have just one portfolio, such as Ford's portfolio of vehicles or Coca-Cola's portfolio of soft drinks, but the DOD is too large and its mission too robust for only one portfolio.

As displayed in Table 1, projects, programs, and portfolios are not interchangeable, as they are separately defined, structured, and executed. These concepts build on each other, as a *project* is the most narrowly scoped item, a *program* is a "group of related projects … that are managed in a coordinated manner," and *portfolios* are "a collection of projects, programs, subsidiary portfolios, and operations managed to achieve strategic objectives" (PMI, 2017b, p. 3). One of the critical elements of the portfolio versus a program or project is the aggregation highlights in Table 1. While programs consist of projects, or program components, that require "coordinated and complimentary" scope, planning, and management, portfolios require a higher coordination threshold, evidenced in the focus on the coordination in aggregate (PMI, 2017b). Additionally, the monitoring and success elements further highlight the differences in scope and focus of programs and portfolios. Program monitoring is focused "to ensure the overall goals, schedules, budget, and benefits of the program will be met" (PMI, 2017b, p. 6). The cost, schedule, and performance metrics currently used meet the standards of monitoring for programs. However, for a portfolio, monitoring requires analyzing the projects and programs within the portfolio in aggregate to determine overall "resource allocation, performance results, and risk of the portfolio" (PMI, 2017b, p. 6). Rather than monitor an individual project or

program, the portfolio considers all aspects of those nested projects and programs to provide an organizational view versus narrowly considering individual projects or programs. Measures of success for programs include cost, schedule, and performance metrics compared to success in a portfolio, which is "measured in terms of the aggregate investment performance and benefit realization" (PMI, 2017b, p. 6) of the portfolio at large. These comparisons highlight the differences and the hierarchy of projects, programs, and portfolios.

Table 1. Comparative Overview of Portfolio, Program, and Project Management. Source: PMI (2017b, p. 6).

Organizational Project Management			
	Projects	**Programs**	**Portfolios**
Definition	A project is a temporary endeavor undertaken to create a unique product, service, or result.	A program is a group of related projects, subsidiary programs, and program activities that are managed in a coordinated manner to obtain benefits not available from managing them individually.	A portfolio is a collection of projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives.
Scope	Projects have defined objectives. Scope is progressively elaborated throughout the project life cycle.	Programs have a scope that encompasses the scopes of its program components. Programs produce benefits to an organization by ensuring that the outputs and outcomes of program components are delivered in a coordinated and complementary manner.	Portfolios have an organizational scope that changes with the strategic objectives of the organization.
Change	Project managers expect change and implement processes to keep change managed and controlled.	Programs are managed in a manner that accepts and adapts to change as necessary to optimize the delivery of benefits as the program's components deliver outcomes and/or outputs.	Portfolio managers continuously monitor changes in the broader internal and external environments.
Planning	Project managers progressively elaborate high-level information into detailed plans throughout the project life cycle.	Programs are managed using high-level plans that track the interdependencies and progress of program components. Program plans are also used to guide planning at the component level.	Portfolio managers create and maintain necessary processes and communication relative to the aggregate portfolio.
Management	Project managers manage the project team to meet the project objectives.	Programs are managed by program managers who ensure that program benefits are delivered as expected, by coordinating the activities of a program's components.	Portfolio managers may manage or coordinate portfolio management staff, or program and project staff that may have reporting responsibilities into the aggregate portfolio.
Monitoring	Project managers monitor and control the work of producing the products, services, or results that the project was undertaken to produce.	Program managers monitor the progress of program components to ensure the overall goals, schedules, budget, and benefits of the program will be met.	Portfolio managers monitor strategic changes and aggregate resource allocation, performance results, and risk of the portfolio.
Success	Success is measured by product and project quality, timeliness, budget compliance, and degree of customer satisfaction.	A program's success is measured by the program's ability to deliver its intended benefits to an organization, and by the program's efficiency and effectiveness in delivering those benefits.	Success is measured in terms of the aggregate investment performance and benefit realization of the portfolio.

B. HISTORY OF TRANSITION FROM PROGRAM MANAGEMENT TO PORTFOLIO MANAGEMENT IN DEFENSE ACQUISITIONS

Portfolio management has technically been required since 2008 with the establishment of DOD Directive 7045.20, *Capability Portfolio Management*, and the framework for portfolio management has been in place since the establishment of PEOs in the 1990s. However, "no substantial changes to the program approach have materialized," as the majority of projects maintained the program-centric model because the overall structure of the defense acquisitions system "is not well suited for portfolio-based management" (Section 809 Panel, 2019a, p. 77). Despite the creation of PEOs in the 1990s and the direction for portfolio management, "PEOs were not assigned any additional duties in statute or DoDD 5000.01 to accomplish portfolio management … instead, they are midlevel managers," without being responsible for or held accountable for a portfolio management baseline (Section 809 Panel, 2019a, p. 77).

Over the last several decades, the U.S. government sponsored numerous efforts, studies, panels, and reports regarding the requirement for DOD acquisitions to undergo significant reform, depart from the historical PM approach, and manage acquisitions in a portfolio-centric model. These efforts were codified by the Section 809 Panel on Streamlining and Codifying Acquisition Regulations as established by the direction contained in the FY2016 NDAA. The purpose of the Section 809 Panel was to "review the acquisition regulations … with a view toward streamlining and improving the efficiency and effectiveness of the Defense acquisition process" (Section 809 Panel, 2017, p. 5). The panel was also charged with making recommendations for changes necessary to improve the process, preserve the integrity of the process, and remove any hindrances to the process. The panel released multiple reports from 2016 to 2019. They produced 98 recommendations for changes and improvements to the defense acquisitions system, with many of the recommendations focusing on the requirement for actual portfolio management.

In arguably one of the strongest recommendations from the last few decades, the Section 809 Panel "identified portfolio management as a priority for reform, recommending not only a change in investment processes but a shift away from the

decades-old program-centric acquisition model" (Shultz, 2020, p. 44). Specifically, the Section 809 Panel's (2019a, p. 17) Recommendation 38 is to "implement best practices for portfolio management" and includes the following language:

> 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. (Section 809 Panel, 2019a, p. 84)

This specific recommendation, along with the FY2021 NDAA requiring a shift to portfolio management, provides the most definitive statement on the importance of portfolio management to the future successes of defense acquisitions.

Despite the Section 809 Panel providing the strongest arguments for portfolio management, specific direction and the inclusion of required language changes in DOD directives and instructions are still lacking. As of July 2019, when the Section 809 Panel was disbanded, only 15 of the recommendations had been implemented, and 12 additional recommendations were pending legislative action in the 2019 cycle. The Section 809 Panel reports, members of the panel, as well as academics and acquisitions professionals have concluded that "historically, there has been a frequent inability to bring about change in defense acquisition" (Shultz, 2020, p. 47). While some acquisitions professionals argue that portfolio management already occurs due to the previous instructions and directives, "each program navigates the acquisition life cycle independently [and] programs design, develop, test, and produce individual systems that meet a defined set of requirements within an allocated budget" (Janiga & Modigliani, 2014, p. 13) regardless of classification under a portfolio.

C. DOD COMPETENCY MODEL

According to DOD Instruction 5000.66, *Defense Acquisition Workforce Education, Training, and Career Development Program*, a *competency* is a "measurable pattern of

knowledge, skills, abilities, behaviors, and other characteristics that an individual needs to perform work roles or occupational functions successfully. Competencies are used to develop acquisition training and education standards" (Office of the Under Secretary of Defense for Acquisition and Sustainment [OUSD(A&S)], 2019, p. 34).

DOD policy requires that functional community competency models be established and maintained by functional leaders (FL)—civilians within the Office of the Under Secretary of Defense for Acquisition and Sustainment. They serve as the subject matter experts and preside over specific acquisitions functions, such as PM (Office of the Under Secretary of Defense for Acquisition and Sustainment [OUSD(A&S)], 2019). FLs coordinate with component DACMs; the executive director, Human Capital Initiatives (HCI); the president of the DAU; and the functional integrated product team (FIPT) on all aspects regarding competency models and requisite certifications. The policy requires the standards to be reviewed and updated annually (OUSD[A&S], 2019).

The *DOD PM Career Field Functional Competencies* (DAU, 2020) fall under Tier 2, Primary Occupational Competencies within the DOD Competency Management Framework, as depicted in Figure 1 (OUSD[A&S], 2019). They define "the needed skills, abilities and knowledge for three levels of [DOD PM] employees as discerned by the PM Working Groups" (MacStravic, 2016, p. 2). The purpose of these standards is to ensure that program managers are trained and can be adequately evaluated on the requisite skills that provide critical warfighting capabilities to the DOD. Specific career path competencies reside at the Tier 3 level—one level down from career field competencies (OUSD[A&S], 2019).

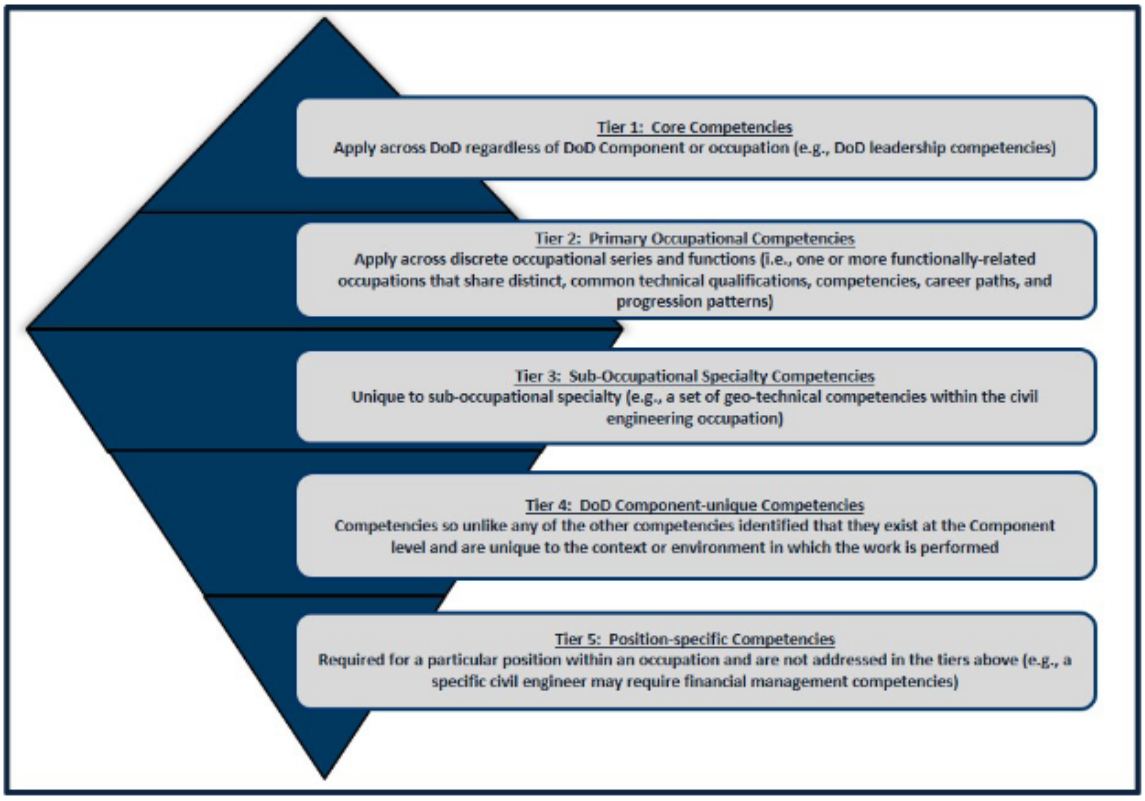

Figure 1. DOD Competency Management Framework. Source: OUSD(A&S; 2019, p. 17).

The DOD further breaks down the structure of competencies and their interaction with the education realm from this overarching framework. Per Figure 2, the Acquisition Education and Training Competency Model Framework, competency standards are divided into units of competency, competency topics, and sub-competencies (OUSD[A&S], 2019, p. 18). Figure 2 demonstrates the intersection of the domains/responsibilities of FLs and the DOD's acquisition training and education arm—the DAU. The Defense Acquisition Workforce Improvement Act (DAWIA) was signed in 1990 after 5 years of study by the Packard Commission and other government entities. As a result of this act, the government created the DAU and assigned it to provide training for acquisition professionals (Karnes, 2020). The DAU is still currently the primary source for acquisition training and offers a robust training package for program managers, which we use as the basis for our analysis.

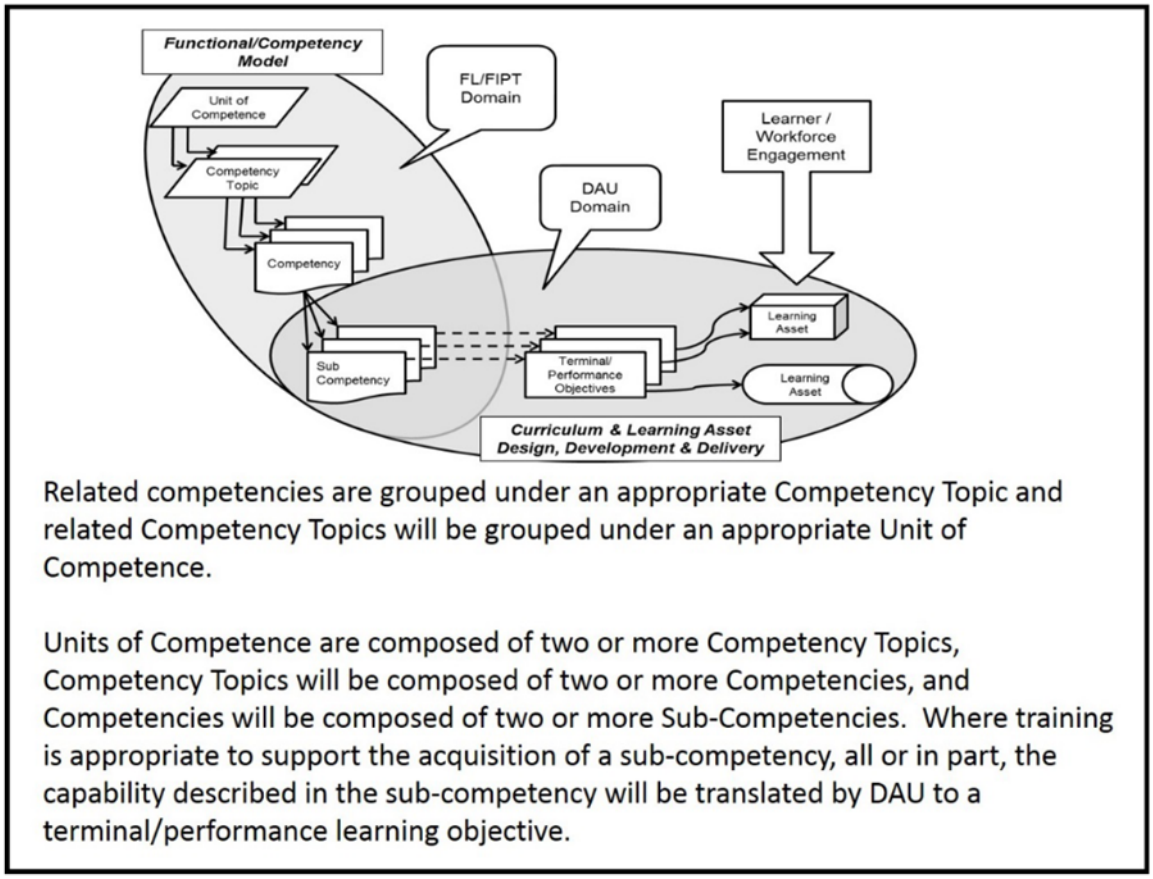

Figure 2. Acquisition Education and Training Competency Model Framework. Source: OUSD(A&S; 2019, p. 18).

Portfolio manager is neither listed as a "career path" nor a "career field." This is because DOD policy states, "Neither the career field nor the career path competency models should contain [DOD] Component-specific or position-specific competencies" (OUSD[A&S], 2019, p. 18). Instead of being listed as a particular career path, the DOD associates portfolio management with the position of PEOs, PMs and deputy PMs of Major Defense Acquisitions Programs (MDAP) and Major Automated Information Systems (MAIS), and PMs and deputy PMs of "significant nonmajor programs" (DAU, n.d.). This is reflected in the Unique Position Training Standards listed under DAU's PM Level III certification guide. This section has two required courses for these critical positions: PMT 4010, Program Management Course, and PMT 4020, Executive Program Manager's Course (Defense Acquisition University [DAU], n.d.). Within the course description and

learning objectives for PMT 4020, portfolio-centric outcomes, impacts, and learning objectives are described and associated with topics such as portfolio strategy, governance, capabilities integration, risk, portfolio performance, and stakeholder management (DAU, 2021). This indicates that the DAU has established a training and education pathway for portfolio management to some degree. However, these outcomes, impacts, and learning objectives are only resident in this 2-week training course. They are not currently linked to any particular competency or sub-competency standards as outlined in the Acquisition Education and Training Competency Model Framework.

Level III certification is required for all DOD acquisitions key leadership positions (KLPs; (OUSD[A&S], 2019). Per DOD Instruction 5000.66, PEOs are listed as KLPs. Therefore, they are required to obtain Level III certification in PM as well as have completed 10 years of experience in an acquisitions workforce position, 4 of which must have been served in a critical acquisition position (CAP; OUSD[A&S], 2019, p. 18). Figure 3 depicts the Acquisition Career Progression model.

Figure 3. Sample Acquisition Career Progression. Source: OUSD(A&S; 2019, p. 20).

In addition to Level III certification and 10 years of experience in acquisitions, PEOs must have served as a PM or deputy PM, complete PMT 4020 within 6 months of

assuming their billet, and agree to serve for 3 years (OUSD[A&S], 2019). These requirements are outlined in Table 2.

Table 2. Additional Requirements for KLPs and CAPs. Source: OUSD(A&S; 2019, p. 22).

POSITION	ADDITIONAL POSITION REQUIREMENTS
All KLPs and CAPs. Note: KLPs for ACAT I and IA programs require 8 years of experience in addition to the functional specific requirements listed in this table.	• Level III certification in the applicable career field (required upon assignment for KLPs, or within grace period for CAPs, as defined in Section 5 of this issuance). • Incumbent must be a member of the Defense Acquisition Corps upon entry into the position. Defense Acquisition Corps membership requirements are outlined in Table 2 of this issuance. • Incumbent must execute a 3-year tenure agreement, except as tailored by the CAE for KLPs or as identified below for ACAT I and IA PMs and DPMs. Note: DoD Components are encouraged to assess incumbents of these positions for rotational opportunities to new assignments after completion of 5 years of service or, in the case of PM, after completion of major program milestone, whichever is longer.
Flag General Officers and Senior Executive Service members. (These may be a KLP or a CAP.)	• 10 years acquisition experience in an AWF position, at least 4 years of which was performed while assigned to a CAP.
PEOs & DPEOs. (These are KLPs.)	• 10 years acquisition experience in an AWF position, at least 4 years of which was performed while assigned to a CAP. • Served as PM or DPM. • Completed DAU Program Manager's Courses.* • Tenure period: 3 years, or as tailored. • Written tenure agreements are required to be assigned to this position. • The CAE must consult with USD(A&S) on PEO assignments. **This requirement cannot be waived.**
PM for MDAPs (ACAT I or IA). (This is a KLP.)	• 8 years acquisition experience, with at least 2 years in a program office or similar organization. • Completed DAU Program Manager's Courses.* • Tenure period: ▪ Program Manager for an ACAT I or IA program assigned before Milestone B will be assigned at least through Milestone B approval. ▪ ACAT I or IA Program Manager assigned immediately following Milestone B approval will be assigned until initial operational capability is achieved. ▪ Program Managers outside of these periods will be assigned for at least 4 years or until completion of the phase that occurs closest in time to 4-year tenure period. • Written tenure agreements are required to be assigned to this position. • DoDI 5000.02 should be consulted for additional details regarding requirements for this position.
DPM for MDAPs (ACAT I or IA). (This is a KLP.)	• 6 years acquisition experience, with at least 2 years in a program office or similar organization. • Completed DAU Program Manager's Courses.* • Tenure period: A minimum of 4 years or closest to next major milestone. • Written tenure agreements are required to be assigned to this position.
PM for Significant Non-major Programs (ACAT II). (This is a KLP.)	• 6 years acquisition experience. • Completed DAU Program Manager's Courses* within 6 months of tenure start date. • Tenure period: A minimum of 3 years. • Written tenure agreements are required to be assigned to this position.

* Indicates the requirement to complete PMT 4020 within 6 months of assuming PM KLP position.

D. PROJECT MANAGEMENT INSTITUTE

The American National Standards Institute (ANSI) recognizes the PMI as the consensus national standard for program, project, and portfolio management certification (Karnes, 2020). The nonprofit organization offers many certification programs for business professionals that are transferrable across industries and national borders. Much has been written regarding PMI Project Management Professional (PMP) and Program Management Professional (PgMP) certifications. While these certifications and competencies feed into portfolio management and will be mentioned during the study, they are not the focus of our analysis. Figure 4 shows the relationship between the disciplines of project, program, and portfolio management.

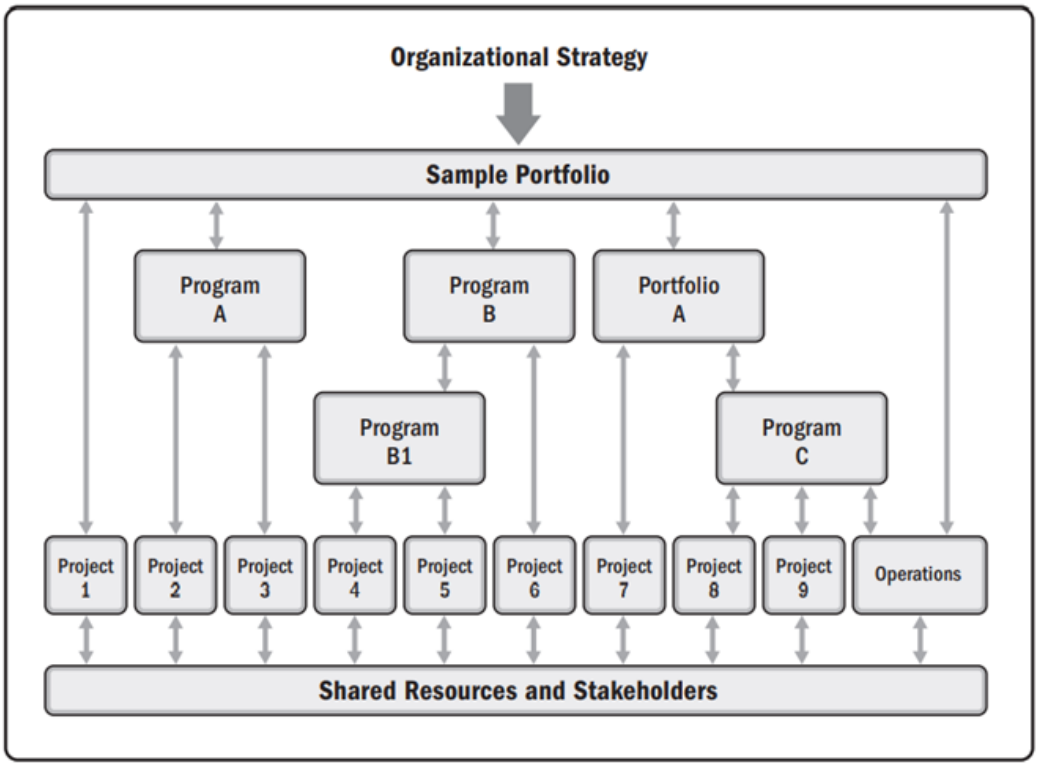

Figure 4. Portfolios, Programs, and Projects: High-Level View. Source: PMI (2017b, p. 4).

PMI offers a PfMP certification. This certification is one of the most rigorous they offer and requires the most experience to apply. Figure 5 outlines the process applicants must complete to be certified as portfolio managers. To be considered for the program, applicants must have a minimum of 8 years of professional business experience. If the applicant has a 4-year degree, they must also have 4 years of unique nonoverlapping professional portfolio management experience. If the applicant does not have a 4-year degree, they must have 7 years of unique nonoverlapping portfolio management experience. This does not mean that the applicant must be the senior portfolio manager but, instead, must just have worked in an organization that uses the portfolio management construct. Applicants must also complete a 500-word summary detailing their portfolio management experience (PMI, 2017a).

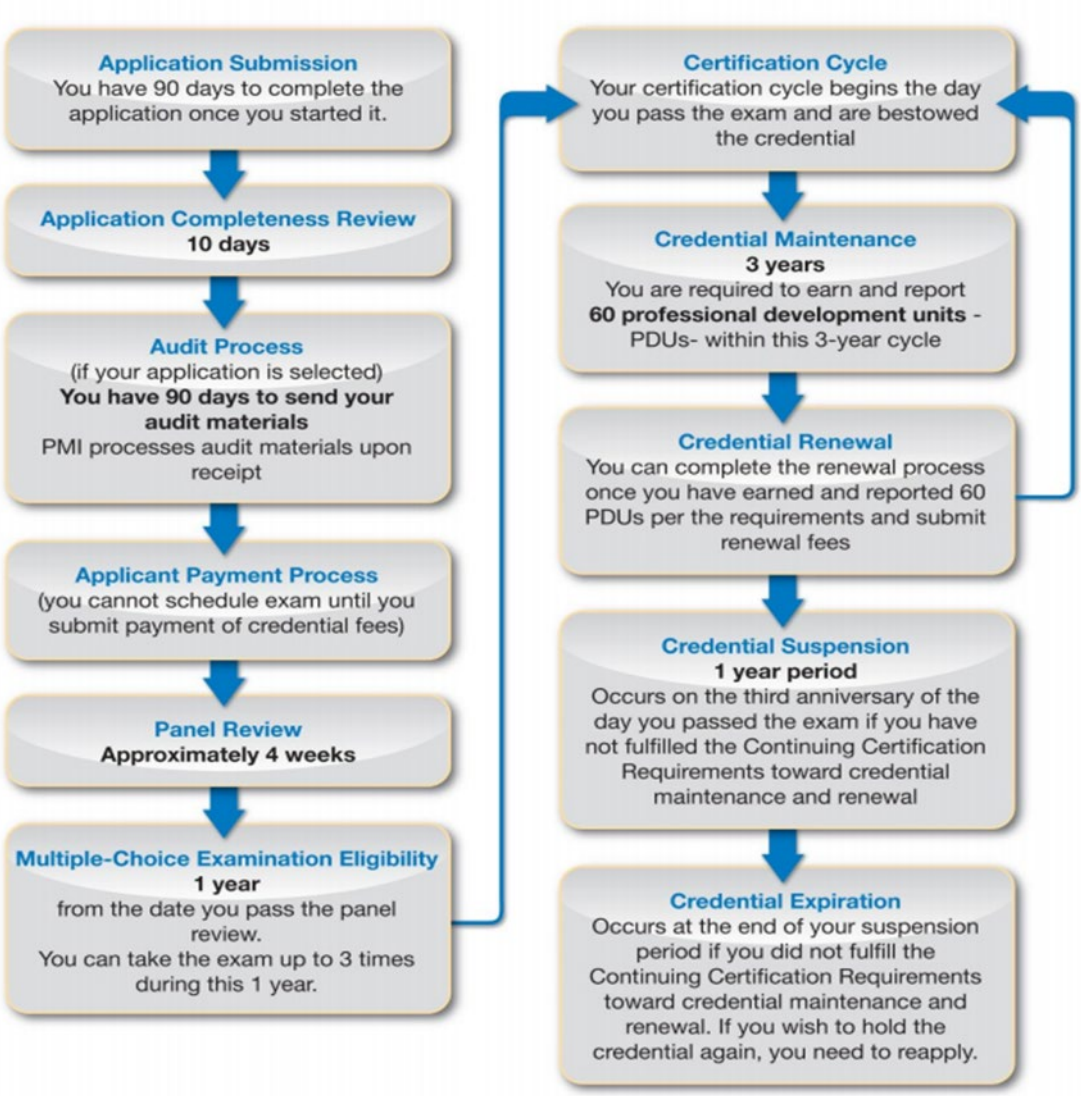

Figure 5. Overview of the PfMP Certification Process. Source: PMI (2017a, p. 4).

Once the application is complete, a panel of volunteer portfolio managers worldwide will review the application and make the accession decision. If accepted, the candidate has 1 year to study for and pass the exam. Candidates are permitted to take the test 3 times in that year. The exam consists of 150 evaluated questions, and candidates have 4 hours to complete them. We will review the exam content in detail later in this paper. Once a candidate has achieved PfMP certification, they must report 60 professional development units (PDUs) every 3 years or have their credential suspended and ultimately

expired if the units are not reported. PDUs are obtained through PMIs' continuing certification requirements program, which offers a flexible option for continuous learning and long-term development to all their members.

PMI delineates the PfMP certification from the others it offers by chartering an independent third-party study every 5 to 7 years (PMI, 2017a). This study is conducted by professionals from around the world and analyzes specific roles associated with the duties of a portfolio manager. PMI competency standards for portfolio management are validated and updated as required to reflect the current best practices of industry professionals. Once the study is complete, PMI sends a survey out to thousands of portfolio managers worldwide requesting feedback on the updated standards. Once the responses are analyzed, a final competency standard is published and used to develop curriculum and testing (PMI, 2017a). The *Standard for Portfolio Management*, 4th edition, explains various tasks related to the six recognized performance domains shown in Figure 4 (PMI, 2017b). However, for certification purposes, PMI only teaches and tests on five domains—including Strategic Alignment, Governance, Portfolio Performance, Portfolio Risk, and Communication (as shown in Figure 6). These five domains and their numerous competencies form the basis of our analysis.

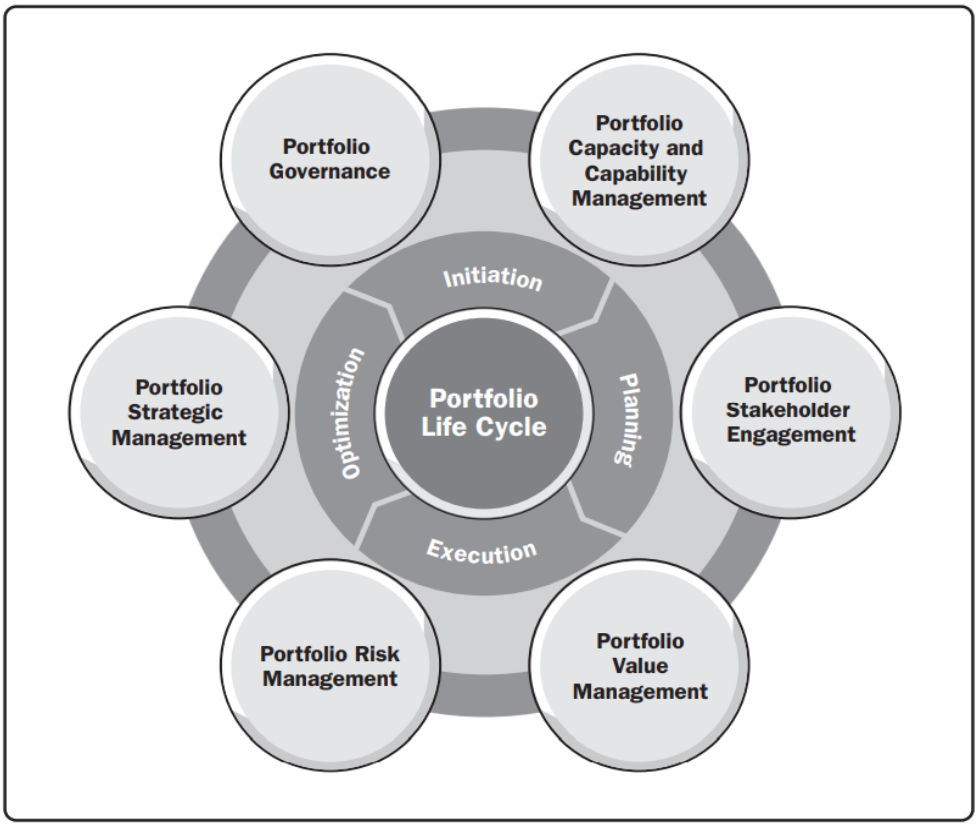

Figure 6. Portfolio Management Performance Domains. Source: PMI (2017b, p. 10).

E. SUMMARY

This chapter provided contextual information concerning PPM, the historical context for portfolio management development in defense acquisitions, and a review of current DOD competency and career progression models. The introduction and delineation of the definitions of projects, programs, and portfolios and the associated certifications and competency standards are the basis of our analysis. They are crucial to the foundation of our methodology detailed in the following chapter. The methodology chapter explains the quantitative and qualitative methods used based on the context of the literature review.

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III. METHODOLOGY

This chapter describes in detail the methodology used to conduct this study, including an explanation of our primary data sources, the methods used to perform the qualitative analysis of the data, the methods used to complete the quantitative analysis of the data, and our data limitations.

We conducted this study using a mixed quantitative and qualitative methods. Specifically, we conducted a competency gap analysis by mapping the current *DOD PM Career Field Functional Competencies* (DAU, 2020) to the PMI (2013) *PfMP Examination Content Outline* domains and tasks to answer our first two research questions:

1. **Are there gaps in the DOD project management competency standards that must be addressed before the DOD can fully implement PPM as directed in the NDAA of 2021?**
2. **Where are the DOD and PMI aligned regarding competency standards?**

To answer the third research question—What barriers exist regarding the implementation of national standards?—we separated the assessed gaps into three qualitative categories based on perceived barriers to implementation (BTI). We categorized the BTI as low, medium, or high. Low BTI indicate the gaps that are easiest to address immediately. Medium BTI show that the Defense Acquisition System (DAS) must alter either personnel or policy to address the gap adequately. Finally, barriers assessed as high indicate that the DAS must change both personnel structure and policy to address the gap adequately.

A gap analysis is the process of reviewing and comparing the current state of operations to a proposed ideal state, highlighting where the current state falls short of the ideal state, and describing the steps required to close the gap (Weller, 2018). We used the PMI (2013) *PfMP Examination Content Outline* domains and tasks as the ideal state for our study. To capture and assess the current state of operations, we used the *DOD PM*

Career Field Functional Competencies (DAU, 2020). We discuss each of these standards in detail in the following sections.

As demonstrated in Chapter II, PM and portfolio management require different but complementary competencies. We acknowledge, therefore, that using the PM competency standards may not offer an immediate best fit. However, the PM competencies capture the focal competencies within the defense acquisitions training and education competency structure for defense acquisitions professionals. In using these standards, we aimed to enable the DOD to achieve the congressional mandate of moving from a PM-centric strategy (current state) to a portfolio management–centric strategy (proposed ideal state). Our use of the *DOD PM Career Field Functional Competencies* (DAU, 2020) provided opportunities for efficiency and a logical progression of competency standards from a program to a portfolio-centric model. In doing this, we did not seek to amend or revise existing PM competencies but rather to study them as the natural foundation for developing the next higher echelon of acquisitions strategy competencies.

By selecting existing competency standards and making the necessary adjustments to fit a new model, the DOD can gain efficiencies in training and education. Additionally, acquisitions professionals can progress within their career tracks more seamlessly by building upon common standards where common standards are warranted. Furthermore, by utilizing the *PfMP Examination Content Outline* (PMI, 2013) as the "ideal state," we ensured that the DOD is basing the defense acquisitions curriculum on the industry's leading competency content and meeting congressional mandates from NDAA requirements.

A. DATA SOURCES

The primary data sources we used for the quantitative and qualitative analyses are the *DOD PM Career Field Functional Competencies* (DAU, 2020) and the PMI (2013) *PfMP Examination Content Outline* domains and tasks.

1. DOD Program Management Career Field Functional Competencies

The *DOD Program Management Career Field Functional Competencies* served as our primary data source for DOD competency standards (DAU, 2020). They are made up of four competency units, including Acquisition Management (AM), Business Management (BM), Technical Management (TM), and Executive Leadership (EL; DAU, 2020). Within each of these competency units are distinct topics, and within each of the topics are specific competencies and their subordinate sub-competencies. Table 3 depicts the overarching structure of the *DOD PM Career Field Functional Competencies* (DAU, 2020). The competency units are depicted as colored headers. The topics within each competency unit are listed in bold, and their nested competencies are indented within each.

Table 3. Program Management Competency Units, Topics, and Competencies. Source: MacStravic (2016, p. 3).

Acquisition Management		Technical Management
Capability Integration Planning	**Program Execution**	**Engineering Management**
Requirements Management (Mgmt)	Risk/Opportunity Mgmt	Technical Planning
Acquisition Program Strategic Planning	Program Planning	Requirements Decomposition
Business Case Development	Teaming	Technical Assessment
Acquisition Law and Policy	Program Oversight	Decision Analysis
Acquisition Policy and Best Practice	Resource Mgmt	Configuration Mgmt
Contractual Laws, Regulations, and Obligations	Technology Mgmt	Technical Data Mgmt
Financial Mgmt Laws, Directives, and Policies	**Services Acquisition**	Interface Mgmt
Program Support Laws, Directives, and Policies	**Business Management**	**Defense Business Systems**
Technical and Engineering Laws, Directives and Policies	**Contract Management**	DBS Certification
Information Technology Laws, Policy, Best Practices	Market Research	DBS Acquisition Approach Preparation
International Acquisition and Exportability	Pre-Solicitation Planning and Execution	**Test and Evaluation Mgmt**
International Cooperative Programs	Source Selection and Negotiations	Test Planning
Sales and Transfers	Contract Administration	Test Execution
Technology Security and Foreign Disclosure	Contract Closeout	**Manufacturing Mgmt**
Defense Exportability Integration	**Financial Mgmt**	Manufacturing Planning and Transition
	Financial Planning	Manufacturing Shutdown
Stakeholder Mgmt	Programming	**Product Support Mgmt**
Political Savvy	Budget Formulation	Product Support Planning
External Situational Awareness	Budget Execution	Product Support Mgmt
Media Relationships	Cost estimates	Supply Chain Mgmt
Executive Leadership		
Foundational Competencies	**Leading Change**	**Results Driven**
Interpersonal Skills	Creativity & Innovation	Accountability
Integrity / Honesty	Vision	Decisiveness
Communicate Effectively	Flexibility	Entrepreneurship
Continual Learning	Resilience	Customer Service
Public Service Motivation	**Leading People**	Problem Solving
Technical Credibility	Conflict Management	
Building Coalitions	Leveraging Diversity	
Influencing / Negotiating	Developing Others	
Partnering	Team Building	

The *DOD PM Career Field Functional Competencies* list breaks down each competency based on this framework, which aligns with the DOD's overall competency framework described in Chapter II. Table 4 provides an excerpt of this format. The four competency units are further broken down into 18 units of competency (UOC)/topics, 69 competencies, and 184 competency elements/sub-competencies. Each row in the table represents an individual competency standard. The first column codes unique competencies by competency unit (e.g., Acquisition Management [AM]). The second column identifies the specific topic within each competency unit (e.g., AM1 – Capability Integration Planning). The third column describes the competency standard. And the fourth column identifies the associated sub-competencies that fall within each competency standard.

Table 4. Excerpt of *DOD PM Career Field Functional Competencies*. Source: DAU (2020).

DoD Program Management Career Field Functional Competencies - Competency Units: 4 - Unit of Competency (UOC): 18 - Competencies: 69 - Competency Elements; 184 - Element Descriptions: Approx. three (basic, intermediate, and advanced) for each competency element				**ANSI Standard** Program Management Institute (PMI) Standard for Project Management does not identify PM "competencies". It does contain – - Project Management Knowledge Areas: 10 - Project Management Processes: 49 mapped to each knowledge area, managed by 5 Process Management Groups
UOC	Topic	Competency Description	Sub-Competencies	Description
Acquisition Management (AM)1	Capability Integration Planning	Supervise the requirements management effort to derive, feasible program and portfolio requirements from the user capability needs statement and CONOPs per Joint Capabilities Integration and Development System (JCIDS) outputs or functional problem statements (for business systems) to establish the Acquisition Program Baseline (APB).	1. Implement a process, in coordination with user(s), to create and manage program requirements baseline (including interfaces) across the program life cycle 2. Establish a time-sensitive process for implementing requirements changes resulting from emerging intelligence information or other sources. 3. Supervise identification and articulation of rapid response situations; ensure use of unique documents and procedures needed to support urgent warfighter needs. 4. Guide requirements process together with user(s) to meet "customer needs" and support decisions in context of system-of-systems architecture. 5. Identify and incorporate best practices in trade-off analysis and system engineering to make requirements related program decisions 6. Ensure the DOD Information Enterprise Architecture is implemented.	**Scope Management**. Includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. Planning Process Group - Plan Scope Management -- Collect Requirements -- Define Scope -- Create WBS - Monitoring & Controlling Process Group -- Validate Scope -- Control Scope
AM1		Supervise the acquisition program strategic planning process to develop and document the organization's mission, vision of success, and fundamental values as they relate to achieving successful acquisition outcomes	1.Supervise and approve the development of an acquisition program baseline. 2. Frame an Acquisition Strategy that addresses the JCIDS requirements given the PPBE resourcing constraints and relevant risks & opportunities. 3. Crosswalk and validate supporting technical, financial, and contract planning documents against the Acquisition Strategy goals and objectives.	**Integration Management**. Includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups - Initiating Process Group: Develop Project Charter - Planning Process Group: Develop Project Management Plan - Executing Process Group: Direct and Manage Project Work; Manage Project Knowledge - Monitoring & Controlling Process Group: Monitor and Control Project Work; Perform Integrated Change Control - Closing Process Group: Close Project or Phase
		Utilize business case development to evaluate the merits and associated trade space of two or more potential solutions that provides industry with the frame work for creating functional activities to develop a product	1. Determine the merits and associated trade space of potential solutions 2.Understand that potential solutions are evaluated based on the merits and associated trade space for each solution.	

This hierarchy produces the standards that personnel must meet to become qualified as PM acquisition professionals. These standards are separated into basic, intermediate, and advanced for each competency element/sub-competency. DAU administers Level I, II, and III training requirements to applicants, and the curriculum for the different levels broadly aligns with the basic, intermediate, and advanced standards. DAU trains thousands of students a year from the DOD acquisition workforce based on these standards (OUSD[A&S], 2021).

2. PMI PfMP Examination Content Outline Domains and Tasks

The PMI (2013) *PfMP Examination Content Outline* served as our primary data source for industry portfolio management competency standards. PMI designed the PfMP exam to reflect the required skills of portfolio management professionals (PMI, 2013). The PfMP exam "measures and evaluates appropriately the specific knowledge and skills required to function as a portfolio management professional" (PMI, 2013, p. 1). The purpose of the exam is to ensure that each required element of portfolio management is accurately measured to validate competency in the portfolio management profession. This purpose aligns precisely with the goal of *DOD PM Career Field Competency Standards* (DAU, 2020), albeit focused on different strategies. The exam outline lists five domains and weights each in terms of importance for assessment. This weight is depicted by the percentage of questions on the exam, as outlined in Table 5. The five assessed domains are Strategic Alignment, Governance, Portfolio Performance, Portfolio Risk Management, and Communications Management. Each of these domains includes subordinate tasks. PfMP domains are equivalent to DOD competency units. PfMP tasks are analogous to DOD competencies.

Table 5. Portfolio Management Professional Examination Domains and Weights. Source: PMI (2013, p. 3).

Domain	Percentage of Items on Exam
Strategic Alignment	25%
Governance	20%
Portfolio Performance	25%
Portfolio Risk Management	15%
Communications Management	15%

a. Domain 1: Strategic Alignment

The purpose of the Strategic Alignment domain is to evaluate an individual's ability to align all components that make up a portfolio, including programs and projects, to the organization's overall strategic objectives and priorities (PMI, 2013). This highlights portfolio management's focus on strategic management. The Strategic Alignment and Portfolio Performance domains are the most heavily weighted portions of the exam at 25% each. The Strategic Alignment domain contains eight tasks, as listed in Table 6.

Table 6. Domain 1: Strategic Alignment Tasks. Source: PMI (2013, p. 4).

Tasks	Strategic Alignment (25%)
Task 1	Evaluate organizational strategic goals and objectives using document reviews, interviewing, and other information gathering techniques in order to understand the strategic priorities.
Task 2	Identify prioritization criteria (e.g., legislative, dependencies, ROI, stakeholder expectations, strategic fit) using information gathering and analysis techniques in order to create a basis for decision making.
Task 3	Rank strategic priorities working with key stakeholders and using qualitative and quantitative analyses in order to provide a guiding framework to operationalize the organizational strategic goals and objectives.
Task 4	Identify existing and potential portfolio components by reviewing documentation such as business plans/proposals in order to create portfolio scenarios.
Task 5	Create portfolio scenarios (what-if analysis) by reviewing components against prioritization criteria and using analysis techniques (e.g., options analysis, risk analysis, SWOT analysis, financial analysis) in order to evaluate and select viable options.
Task 6	Recommend portfolio scenario(s) and related components, based on prioritization analysis/criteria, in order to provide governance with a rationale for decision making.
Task 7	Determine the impact to portfolio and portfolio components due to changes in strategic goals and objectives, in order to sustain strategic alignment.
Task 8	Create high level portfolio roadmap working with key stakeholders using prioritization, interdependency analysis, and organizational constraints in order to confirm and communicate the portfolio components sequencing, dependencies, and strategic alignment.

b. Domain 2: Governance

The purpose of the Governance domain is to evaluate an individual's ability to oversee the portfolio; to create the overall management plan, including performance standards, best practices, processes and procedures, and overall management structure; and to manage decision-making elements to ensure proper authorization of portfolio execution (PMI, 2013). The Governance domain, weighted at 20%, is the third most important set of competencies behind Strategic Alignment and Portfolio Performance. It includes the 5 tasks as listed in Table 7.

Table 7. Domain 2: Governance Tasks. Source: PMI (2013, p. 5).

Tasks	Governance (20%)
Task 1	Define and establish a governance model including the structure (including but not limited to steering committees, governance boards), policies, and decision-making roles, responsibilities, rights and authorities in order to support effective decision-making and achieve strategic goals.
Task 2	Determine portfolio management standards, protocols, rules, and best practices, using organizational assets (such as information systems, subject-matter experts) and industry standards in order to establish consistent portfolio management practices.
Task 3	Define and/or modify portfolio processes and procedures including but not limited to benefits realization planning, information management, performance, communication, risk management, stakeholder engagement, resource management, and change management in order to manage the portfolio efficiently and effectively.
Task 4	Create the portfolio management plan including, but not limited to, roles and responsibilities, governance model, escalation procedures, risk tolerances, and governance thresholds, change control and management, key performance indicators, prioritization model, and communication procedures using standards, models, and other organizational assets in order to ensure effective and efficient portfolio management.
Task 5	Make recommendations and obtain approval regarding portfolio decisions (e.g, components, plans, budget, roadmap) through communication with key decision makers as defined by the governance model, in order to authorize the execution of the portfolio.

c. Domain 3: Portfolio Performance

The purpose of the Portfolio Performance domain is to evaluate an individual's ability to oversee the execution of the portfolio within the established governance parameters set under the previous domain, to assess and balance the components of the portfolio based on performance and changes in strategic alignment, and to monitor the overall health of the portfolio (PMI, 2013). The Portfolio Performance domain, along with Strategic Alignment, is weighted at 25%. It includes the 10 tasks listed in Table 8.

Table 8. Domain 3: Portfolio Performance Tasks. Source: PMI (2013, p. 6).

Tasks	Portfolio Performance (25%)
Task 1	Initiate the portfolio using the portfolio roadmap and supporting artifacts in order to authorize the portfolio structure and activate the components.
Task 2	Collect and consolidate key performance metric data, as defined by portfolio governance and using various techniques, in order to measure the health of the portfolio.
Task 3	Monitor the portfolio performance on an ongoing basis, using reports, conversations, dashboards, and auditing techniques in order to ensure portfolio effectiveness and efficiency and maintain strategic alignment.
Task 4	Manage and escalate issues by communicating recommended actions to appropriate decision makers for timely approval and implementation of proposed solution(s).
Task 5	Manage portfolio changes using change management techniques, in order to improve portfolio performance and maintain strategic alignment.
Task 6	Balance portfolio and prioritize portfolio components, using established criteria and methods in order to optimize resource utilization and achieve strategic portfolio objectives.
Task 7	Analyze and optimize the consolidated allocation/reallocation of capacity (e.g., people, tools, materials, technology, facilities, financial) using supply/demand management and scenario analysis techniques to ensure portfolio efficiency and effectiveness.
Task 8	Update and refine existing portfolio road maps, using change analysis in order to facilitate re-allocation of organizational resources to the portfolio.
Task 9	Measure the aggregated portfolio performance results against the defined business or strategic goals and objectives in order to demonstrate progress toward the achievement of business or strategic goals.
Task 10	Maintain records by capturing portfolio artifacts, such as approvals, prioritizations, and other decisions, in order to ensure compliance with organizational policies, regulatory requirements, and portfolio management standards.

d. Domain 4: Portfolio Risk Management

The purpose of the Portfolio Risk Management domain is to evaluate an individual's ability to evaluate portfolio risk and align it with the risk appetite of the organization (PMI, 2013). It is weighted at 15% and includes the 6 tasks listed in Table 9.

Table 9. Domain 4: Portfolio Risk Management Tasks. Source: PMI (2013, p. 7).

Tasks	Portfolio Risk Management (15%)
Task 1	Determine acceptable level of risk for the portfolio, based on organizational and stakeholder risk tolerances, in order to provide input to governance.
Task 2	Develop the portfolio risk management plan, using governance risk guidelines, processes, and procedures and other organizational assets in order to capitalize on opportunities, and respond to risks.
Task 3	Perform dependency analysis to identify and monitor risks related to the interdependencies and intradependencies within or across portfolios in order to support decision-making.
Task 4	Develop, monitor, and maintain portfolio-level risk register, including risks to strategic goals and objectives, to business value, and escalated from portfolio components, using risk management processes in order to support decision making.
Task 5	Promote common understanding and stakeholder ownership of portfolio risks, through communications with stakeholders, in order to facilitate risk response.
Task 6	Provide recommendation and obtain approval for a portfolio management reserve, based on aggregate portfolio risk exposure, in order to optimize portfolio strategic goals and objectives.

e. Domain 5: Communications Management

The purpose of the Communications Management domain is to evaluate an individual's ability to conduct activities including stakeholder management, conflict management, and stakeholder engagement (PMI, 2013). It is weighted at 15% and includes the 6 tasks listed in Table 10.

Table 10. Domain 5: Communications Management Tasks. Source: PMI (2013, p. 8).

Tasks	Communications Management (15%)
Task 1	Analyze internal and external stakeholders using techniques such as meetings, interviews, surveys/questionnaires, in order to identify stakeholder expectations, interests, and influence on the success of the portfolio.
Task 2	Create the aggregate communication strategy and plan, including methods, recipients, vehicles, timelines and frequencies in order to enable effective communication to stakeholders.
Task 3	Engage stakeholders, through oral and written communication, to ensure awareness, manage expectations, foster support, and build relationships and collaboration for the success of the portfolio roadmap.
Task 4	Maintain the communication strategy and plan by evaluating current communications capabilities, identifying gaps, and documenting communications plan to meet stakeholder requirements.
Task 5	Prepare and/or facilitate stakeholder understanding of portfolio management-related processes, procedures, and protocols using organizational assets (e.g., information systems, training delivery methods) in order to promote common understanding and application of the portfolio management process.
Task 6	Verify accuracy, consistency, and completeness of portfolio communication, utilizing governance guidelines, to maintain credibility and satisfaction with all stakeholders.

B. QUALITATIVE ANALYSIS OF DATA

To assess the qualitative gaps in the DOD's portfolio management competency standards, we took the following steps:

1. **We reviewed all DAU career fields and selected the field most closely associated with portfolio management. As discussed, not only is PM the most closely associated career field, but it is also the focal strategy of defense acquisitions and best represents the current state of operations to compare with the proposed ideal state of portfolio management.**

2. **We then conducted a lexicographic analysis of keywords and the principal purpose of each DOD PM competency. We attempted to match each DOD PM competency to each of the PMI PfMP domains**

and tasks. Karnes's (2020) work on aligning PM competencies with PMI standards informed our approach. However, our methodology differs in one key area: In conducting a gap analysis, our goal is to raise the current state of operations (PM competency standards) to the ideal state (PMI PfMP domains and tasks). In doing so, the PMI PfMP domains and tasks became the basis of comparison. Karnes (2020) mapped each PMI standard to each DOD PM competency standard to show alignment. We, however, mapped as many applicable DOD PM standards as possible to the PMI standard. Meaning, if a DOD PM competency standard did not align with a PMI standard, it may not appear in the analysis. This approach ensured that we were not simply attempting to find alignment where no alignment existed or focus on maintaining competency standards that did not apply to a fundamentally different acquisitions strategy. However, it supported identifying commonalities and building upon existing DOD PM competency structures to minimize duplicates or unnecessarily modified standards.

3. **We then created a competency alignment matrix with three classifications of alignment: No Discernible Alignment (color code: red), Partial Alignment (color code: yellow), or Full Alignment (color code: green). It is organized first by PMI PfMP domain and then by PfMP task. The task number and description match the task number and description from the *PfMP Exam Content Outline* (PMI, 2013). As previously discussed, we then mapped each applicable DOD PM competency to the PMI task. Each competency includes the UOC/ topic number (e.g., AM1), the competency description listed in the *DOD PM Career Field Functional Competencies* (DAU, 2020), and a color-coded qualitative alignment assessment.**

4. **We based our assessment of alignment on the following criteria after our lexicographic review of keywords and comparison of task and competency purposes and functions:**

   - *No Discernible Alignment* indicated that no current DOD PM competency standard fit the description of a PMI-stated task.
   - *Partial Alignment* indicated that one or more keywords or the general purpose of the DOD PM competency or sub-competencies related to the PMI stated task.
   - *Full Alignment* indicated that an existing DOD PM competency standard matched the PMI stated task to the degree that included several exact word matches or clearly aligned descriptions, purposes, or applications.

5. **After reviewing and matching all applicable DOD PM competency standards to the PMI domains and tasks, we assessed each gap based on perceived BTI. A shift from a PM-centric to a portfolio management-centric strategy will inherently require policy and operational changes. The assessed barriers signal to defense acquisitions decision-makers the areas where we perceive that implementation would be the most challenging. The color-coding of alignment guided an initial assessment, but a lexicographic alignment of competency standards may not correlate directly with ease of implementation. The coding approach used to analyze alignment includes the following:**

   - We defined *No BTI* as practices that already occur within the DOD.
   - We defined *Low BTI* as changes that the DOD could implement immediately with little to no change in personnel structure or additional policy concerns.

- We defined *Medium BTI* as changes that would require either significant changes in policy or personnel structure.
- We defined *High BTI* as changes that would require both significant personnel and policy changes.

An excerpt of the matrix is provided in Table 11.

Table 11. Competency Alignment Matrix Excerpt.

PMI Portfolio Management Professional (PfMP) Compentencies		DoD Program Management Career Field Functional Compentencies			19%	Barrier to Implementation Rating	1.63	Alignment Legend			Barrier to Implementation Rating	
Domain 1: Strategic Alignment								Color	Alignment	Alignment Score	Rating	Meaning
Task #	Task	UOC	Competency	Alignment Score								
1	Evaluate organizational strategic goals and objectives using document reviews, interviewing, and other information gathering techniques in order to understand the strategic priorities.	AM1	Supervise the acquisition program strategic planning process to develop and document the organization's mission, vision of success, and fundamental values as they relate to achieving successful acquisition outcomes	0.5		1						
2	Identify prioritization criteria (e.g., legislative, dependencies, ROI, stakeholder expectations, strategic fit) using information gathering and analysis techniques in order to create a basis for decision making.		No Discernable Alignment	0		2			No Discernable Alignment	0	0	Practice Already Occurs
3	Rank strategic priorities working with key stakeholders and using qualitative and quantitative analyses in order to provide a guiding framework to operationalize the organizational strategic goals and objectives.		No Discernable Alignment	0		2			Partial Alignment	0.5	1	Low
4	Identify existing and potential portfolio components by reviewing documentation such as business plans/proposals in order to create portfolio scenarios.	BM1	Plan and lead a market research effort to define the industry/ procurement environment and gather and apply relevant market research information to initiate and execute the program. Utilize PCO advice on source selection sensitive information in scenarios involving contractors to prevent future conflict of interest or potential competitive advantage.	0.5		2			Full Alignment	1	2	Medium
5	Create portfolio scenarios (what-if analysis) by reviewing components against prioritization criteria and using analysis techniques (e.g., options analysis, risk analysis, SWOT analysis, financial analysis) in order to evaluate and select viable options.		No Discernable Alignment	0		1					3	High
6	Recommend portfolio scenario(s) and related components, based on prioritization analysis/criteria, in order to provide governance with a rationale for decision making.		No Discernable Alignment	0		1						
7	Determine the impact to portfolio and portfolio components due to changes in strategic goals and objectives, in order to sustain strategic alignment.		No Discernable Alignment	0		2						
8	Create high level portfolio roadmap working with key stakeholders using prioritization, interdependency analysis, and organizational constraints in order to confirm and communicate the portfolio components sequencing, dependencies, and strategic alignment.	AM3	Analyze an integrated master plan (IMP) confirming measures of effectiveness, measures of performance, technical performance measures and accomplishment criteria accurately define the program architecture consistent with the acquisition strategy, SEP and TEMP	0.5		2						

C. QUANTITATIVE ANALYSIS OF DATA

To assess a quantitative measure of alignment, we utilized the following Alignment Score scale:

- No Discernible Alignment = 0
- Partial Alignment = 0.5
- Full Alignment = 1

We assigned each PMI PfMP task an alignment score based on the qualitative assessment outlined above using this scale. Within each PfMP domain, we calculated the average score (i.e., the total score of all tasks divided by the total number of tasks within the domain). We rounded to the nearest percentage point to provide a quantitative domain alignment percentage. This percentage indicates the degree to which the DOD is already postured to transition to train, educate, and assess portfolio management skills based on its current PM competency standards.

To assess a quantitative measure of BTI, we utilized the following Barrier to Implementation Rating scale:

- No BTI = 0
- Low BTI = 1
- Medium BTI = 2
- High BTI = 3

We assigned each PMI PfMP task a BTI rating using this scale based on the qualitative assessment outlined above. Within each PfMP domain, we calculated the average score (i.e., the total score of all tasks divided by the total number of tasks within the domain). We rounded to the nearest one-hundredth of a point to provide a quantitative domain BTI rating. This rating indicates the assessed degree of difficulty in implementing portfolio management standards based on current DOD practices, personnel, and policy.

D. LIMITATIONS

Our research methods have the following limitations.

1. Data and Analysis Limited to Policy Comparison

This research centered on a comparison of DOD competency standards and PMI professional certification standards. While these elements are designed to succinctly capture the fundamental knowledge, skill, and best practices required to be an effective acquisitions professional, we acknowledge that informal networks and nuanced professional experiences are critical to the success of any organization. However, we viewed these nuances as difficult to objectively qualify or quantify and focused on the objective standards that apply across the defense acquisitions system and industry portfolio management practices.

2. Researchers' Limited Experience With Enterprise-Level Defense Acquisitions or PMI PfMP Certification

Similar to the above statements regarding this study as policy analysis, we are limited by our lack of professional experience in the defense acquisitions community. Additionally, we do not hold PfMP certifications. However, our study is based on the stated standards represented by the foundational policies or documents that govern them. We see our lack of direct experience as a positive barrier against partiality or comfortability with informal or unstated standards.

3. The DOD and Industry Are Inherently Different Organizations

Much has been written on the fundamental differences in processes, policies, procedures, goals, concepts of value, and more between defense acquisitions and industry operations. We acknowledge that these differences are important to note and understand. However, we conducted this study based on the previous two NDAAs, which specifically mandate the use of industry professional standards (NDAA for FY2020) and a shift from PM to portfolio management (NDAA for FY2021).

E. CONCLUSION

This chapter covered the general research approach and primary data sources. It also included an in-depth review of the qualitative and quantitative methods used to conduct the study and touched on the researchers' data limitations. The following chapters provide the results, analysis, recommendations, and conclusions of the study outlined in this chapter.

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IV. RESULTS

In this chapter, we report the results of our gap analysis and BTI analysis. We start first by displaying the overall quantitative results of the gap analysis as an alignment score and then transition to a more qualitative detailed breakdown of the gaps in the DOD standard by each domain of the PfMP standard. We finish the chapter by reporting the results from the BTI analysis.

A. OVERALL ALIGNMENT

Table 12 depicts the alignment between the PMI PfMP competency standards and the DOD competency standards broken down by PfMP domain. The overall average alignment of the two standards is 41%. However, within each domain, those alignment scores vary significantly. In the domains of Strategic Alignment and Governance, the DOD is very poorly aligned with PfMP standards, while in the domain of Communications Management, the two standards are aligned 100%. When evaluating the overall alignment score, it is crucial to recognize the weights of each domain from the *PfMP Examination Content Outline* (PMI, 2013). The three most heavily weighted domains—Strategic Alignment, Portfolio Performance, and Governance—exhibit the three lowest alignment percentages of the five domains. The remaining two domains—Portfolio Risk Management and Communications Management—exhibit the highest alignment but are the least heavily weighted domains in the PfMP certification exam. This is significant because the weights from the exam represent the importance of the domain in evaluating competency. This is calculated by taking the weighted average—multiplying the PfMP exam weights by the assessed alignment percentages. For example, the Strategic Alignment domain is worth 25% of the PfMP exam. It is then multiplied by the assessed percentage—19%—for a total score of 4.75%. When each domain is weighted and summed, the assessed alignment drops to 36%.

Table 12. Raw and Weighted Alignment Scores.

Domain	Alignment Score	Exam Weight
Strategic Alignment	19%	25%
Governance	0%	20%
Portfolio Performance	35%	25%
Portfolio Risk Management	50%	15%
Communications Management	100%	15%
Average Alignment	**41%**	**36%**

B. DETAILED ALIGNMENT ANALYSIS BY DOMAIN

As shown in Table 12, the most significant gap to be addressed is in the Governance domain. Following Governance are Strategic Alignment, Portfolio Performance, and Portfolio Risk management, respectively. In the following sections, we break down each domain and highlight the level of alignment by task.

1. Domain 1: Strategic Alignment

Table 13 depicts a detailed view of our analysis in the Strategic Alignment domain. We observed partial alignment in such tasks as evaluating organizational strategic goals, gathering data, and identifying potential portfolio components through business plans, because those tasks must be done even in a program-centric model. There was no discernable alignment for five of the eight tasks because they spoke specifically to tasks carried out by an organization with the structure and policy to execute portfolio management.

Table 13. Strategic Alignment Domain Comparison.

PMI Portfolio Management Professional (PfMP) Compentencies		DoD Program Management Career Field Functional Compentencies					
Domain 1: Strategic Alignment							
Task #	Task	UOC	Competency	Alignment Score	19%	Barrier to Implementation Rating	1.63
1	Evaluate organizational strategic goals and objectives using document reviews, interviewing, and other information gathering techniques in order to understand the strategic priorities.	AM1	Supervise the acquisition program strategic planning process to develop and document the organization's mission, vision of success, and fundamental values as they relate to achieving successful acquisition outcomes	0.5		1	
2	Identify prioritization criteria (e.g., legislative, dependencies, ROI, stakeholder expectations, strategic fit) using information gathering and analysis techniques in order to create a basis for decision making.		No Discernable Alignment	0		2	
3	Rank strategic priorities working with key stakeholders and using qualitative and quantitative analyses in order to provide a guiding framework to operationalize the organizational strategic goals and objectives.		No Discernable Alignment	0		2	
4	Identify existing and potential portfolio components by reviewing documentation such as business plans/proposals in order to create portfolio scenarios.	BM1	Plan and lead a market research effort to define the industry/ procurement environment and gather and apply relevant market research information to initiate and execute the program. Utilize PCO advice on source selection sensitive information in scenarios involving contractors to prevent future conflict of interest or potential competitive advantage.	0.5		2	
5	Create portfolio scenarios (what-if analysis) by reviewing components against prioritization criteria and using analysis techniques (e.g., options analysis, risk analysis, SWOT analysis, financial analysis) in order to evaluate and select viable options.		No Discernable Alignment	0		1	
6	Recommend portfolio scenario(s) and related components, based on prioritization analysis/criteria, in order to provide governance with a rationale for decision making.		No Discernable Alignment	0		1	
7	Determine the impact to portfolio and portfolio components due to changes in strategic goals and objectives, in order to sustain strategic alignment.		No Discernable Alignment	0		2	
8	Create high level portfolio roadmap working with key stakeholders using prioritization, interdependency analysis, and organizational constraints in order to confirm and communicate the portfolio components sequencing, dependencies, and strategic alignment.	AM3	Analyze an integrated master plan (IMP) confirming measures of effectiveness, measures of performance, technical performance measures and accomplishment criteria accurately define the program architecture consistent with the acquisition strategy, SEP and TEMP	0.5		2	

2. Domain 2: Governance

The most significant gaps in the DOD competency standard regarding portfolio management are related to the Governance domain. As shown in Table 14, we observed 0% alignment in this domain. The tasks in this domain include establishing policies, procedures, authorities, and management models that align with portfolio management practices. The current DOD standards do not speak to this. Moreover, in practice these Governance models either do not exist or, at the very least, are not codified in writing.

Table 14. Governance Domain Comparison.

Domain 2: Governance							
Task #	Task	UOC	Competency	Alignment Score	0%	Barrier to Implementation Rating	3
1	Define and establish a governance model including the structure (including but not limited to steering committees, governance boards), policies, and decision-making roles, responsibilities, rights and authorities in order to support effective decision-making and achieve strategic goals.		No Discernable Alignment	0		3	
2	Determine portfolio management standards, protocols, rules, and best practices, using organizational assets (such as information systems, subject[1]matter experts) and industry standards in order to establish consistent portfolio management practices.		No Discernable Alignment	0		3	
3	Define and/or modify portfolio processes and procedures including but not limited to benefits realization planning, information management, performance, communication, risk management, stakeholder engagement, resource management, and change management in order to manage the portfolio efficiently and effectively.		No Discernable Alignment	0		3	
4	Create the portfolio management plan including, but not limited to, roles and responsibilities, governance model, escalation procedures, risk tolerances, and governance thresholds, change control and management, key performance indicators, prioritization model, and communication procedures using standards, models, and other organizational assets in order to ensure effective and efficient portfolio management.		No Discernable Alignment	0		3	
5	Make recommendations and obtain approval regarding portfolio decisions (e.g, components, plans, budget, roadmap) through communication with key decision makers as defined by the governance model, in order to authorize the execution of the portfolio.		No Discernable Alignment	0		3	

3. Domain 3: Portfolio Performance

In the domain of Portfolio Performance, the DOD competency standard was 35% aligned with the PfMP standard. We observed full alignment in three of the 10 tasks and partial alignment in one. As shown in Table 15, the places where the standards align include monitoring performance and ensuring strategic alignment with organizational goals. Moreover, they align in training personnel to escalate issues to appropriate decision-makers, propose solutions, and determine the decision's impacts on the organization.

However, the standards did not align in six of the 10 tasks related to Portfolio Performance. Specifically, the PfMP standard calls for training in creating and implementing a portfolio road map. Since the DOD only trains personnel at the program level, this structure and policy do not exist. Moreover, the DOD does not currently train personnel on balancing, prioritizing, or optimizing funding across a portfolio, which is a central theme in portfolio management.

Table 15. Portfolio Performance Comparison.

Domain 3: Portfolio Performance							
Task #	Task	UOC	Competency	Alignment Score	35%	Barrier to Implementation Rating	1.30
1	Initiate the portfolio using the portfolio roadmap and supporting artifacts in order to authorize the portfolio structure and activate the components.		No Discernable Alignment	0		2	
2	Collect and consolidate key performance metric data, as defined by portfolio governance and using various techniques, in order to measure the health of the portfolio.	EL4	(Entrepreneurship) Position the organization for future success by identifying new opportunities, improving products or services. Compose appropriate metrics to obtain feedback and implement process improvements. Execute process improvement methods to eliminate time, economic, and product waste.	0.5		1	
3	Monitor the portfolio performance on an ongoing basis, using reports, conversations, dashboards, and auditing techniques in order to ensure portfolio effectiveness and efficiency and maintain strategic alignment.	EL4	Hold self and others accountable for measurable high-quality, timely, and cost-effective results by monitoring progress and evaluates outcomes to improve organizational efficiency and effectiveness. Quality Management. Includes the processes for incorporating the organization's quality policy regarding planning, managing, and controlling project and product quality requirements, in order to meet stakeholders' expectations.	1		0	
4	Manage and escalate issues by communicating recommended actions to appropriate decision makers for timely approval and implementation of proposed solution(s).	EL4	Make well-informed, effective, and timely decisions, even when data are limited or solutions produce unpleasant consequences; perceive the impact and implications of decisions	1		1	
5	Manage portfolio changes using change management techniques, in order to improve portfolio performance and maintain strategic alignment.	EL4, EL5	EL4: See above. EL5: (Problem Solving) Conduct an evaluation of a program to identify, analyze, and create solutions for problems. Distinguish between relevant and irrelevant information to make logical judgments. Implement an appropriate corrective action plan within program resources	1		1	
6	Balance portfolio and prioritize portfolio components, using established criteria and methods in order to optimize resource utilization and achieve strategic portfolio objectives.		No Discernable Alignment	0		2	
7	Analyze and optimize the consolidated allocation/reallocation of capacity (e.g., people, tools, materials, technology, facilities, financial) using supply/demand management and scenario analysis techniques to ensure portfolio efficiency and effectiveness.		No Discernable Alignment	0		1	
8	Update and refine existing portfolio road maps, using change analysis in order to facilitate re-allocation of organizational resources to the portfolio.		No Discernable Alignment	0		2	
9	Measure the aggregated portfolio performance results against the defined business or strategic goals and objectives in order to demonstrate progress toward the achievement of business or strategic goals.		No Discernable Alignment	0		1	
10	Maintain records by capturing portfolio artifacts, such as approvals, prioritizations, and other decisions, in order to ensure compliance with organizational policies, regulatory requirements, and portfolio management standards		No Discernable Alignment	0		2	

4. Domain 4: Portfolio Risk Management

As depicted in Table 16, we observed 50% alignment in the domain of Portfolio Risk Management. The DOD standard devotes significant time to outlining ways in which acquisitions personnel must identify and mitigate risk. However, in half of the tasks listed in the PfMP standard, the document speaks directly to processes and procedures unique to a portfolio management structure. These include tasks such as dependency analysis, portfolio-level risk registers, and analysis of portfolio management reserves. The DOD's program-centric training does not require similar practices.

Table 16. Portfolio Risk Management Comparison.

Domain 4: Portfilio Risk Management							
Task #	Task	UOC	Competency	Alignment Score	50%	Barrier to Implementation Rating	1.33
1	Determine acceptable level of risk for the portfolio, based on organizational and stakeholder risk tolerances, in order to provide input to governance.	AM3	Establish, specify, and manage an integrated risk, issue and opportunity management process. Risk Management. Includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project.	1		1	
2	Develop the portfolio risk management plan, using governance risk guidelines, processes, and procedures and other organizational assets in order to capitalize on opportunities, and respond to risks.	AM3	Establish, specify, and manage an integrated risk, issue and opportunity management process. Includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project.	1		1	
3	Perform dependency analysis to identify and monitor risks related to the interdependencies and intradependencies within or across portfolios in order to support decision-making.		No Discernable Alignment	0		2	
4	Develop, monitor, and maintain portfolio-level risk register, including risks to strategic goals and objectives, to business value, and escalated from portfolio components, using risk management processes in order to support decision making.		No Discernable Alignment	0		1	
5	Promote common understanding and stakeholder ownership of portfolio risks, through communications with stakeholders, in order to facilitate risk response.	EL1	Plan for the dissemination of information both internally and externally with emphasis on ensuring all work groups, project oriented teams, IPPTs, PM Staff and several layers of contractor/sub-contractor employees have comprehensive macro view of the program priorities	1		1	
6	Provide recommendation and obtain approval for a portfolio management reserve, based on aggregate portfolio risk exposure, in order to optimize portfolio strategic goals and objectives		No Discernable Alignment	0		2	

5. Domain 5: Communications Management

Table 17 shows the alignment of the two standards in the domain of Communications Management. In this domain, we observed 100% alignment. The DOD standard goes to great lengths to describe the type of communication they expect from their acquisition professionals. This training is easily transferrable to a portfolio management format. Moreover, in this section of the PfMP standard, there is less portfolio-specific verbiage used. Instead, it is spelled out how portfolio managers should engage stakeholders and communicate up and down the chain of command.

Table 17. Communications Domain Comparison.

Domain 5: Communications Management							
Task #	Task	UOC	Competency	Alignment Score	100%	Barrier to Implementation Rating	0
1	Analyze internal and external stakeholders using techniques such as meetings, interviews, surveys/questionnaires, in order to identify stakeholder expectations, interests, and influence on the success of the portfolio.	AM3	Organize, manage, coach, lead and evaluate program teams (working groups, IPTs, project-oriented teams, support contractor teams, system integrator/supplier teams) to maximize efficiency within the program/portfolio.	1		0	
2	Create the aggregate communication strategy and plan, including methods, recipients, vehicles, timelines and frequencies in order to enable effective communication to stakeholders.	AM4	Maintain awareness of the environment external to an acquisition program simultaneously from (including) historical, current, and future perspectives. Apply the media related policies contained in Agency directives/publications in addressing public affairs.	1		0	
3	Engage stakeholders, through oral and written communication, to ensure awareness, manage expectations, foster support, and build relationships and collaboration for the success of the portfolio roadmap.	EL1	(Communicate Effectively) Plan for the dissemination of information both internally and externally with emphasis on ensuring all work groups, project oriented teams, IPPTs, PM Staff and several layers of contractor/sub-contractor employees have comprehensive macro view of the program priorities.. 1. Write in a clear, concise, organized, and convincing manner for the intended audience. 2. Make clear and convincing oral presentations. Listen effectively; clarify information as needed. 4. Share & communicate lessons learned. Explain how process improvements at the macro level translate into improved operational effectiveness. 5. Pursue chances to stretch skills to further professional growth to include using challenges as opportunities to improve and become more effective.	1		0	
4	Maintain the communication strategy and plan by evaluating current communications capabilities, identifying gaps, and documenting communications plan to meet stakeholder requirements.			1		0	
5	Prepare and/or facilitate stakeholder understanding of portfolio management[1]related processes, procedures, and protocols using organizational assets (e.g., information systems, training delivery methods) in order to promote common understanding and application of the portfolio management process.			1		0	
6	Verify accuracy, consistency, and completeness of portfolio communication, utilizing governance guidelines, to maintain credibility and satisfaction with all stakeholders.			1		0	

C. BTI ANALYSIS

Figure 7 reflects the BTI rating for each domain of the PfMP standard. The overall BTI score is 1.45, reflecting a low to medium BTI level for most gaps discovered in the DOD standard. This means that many of the skills trained in the DOD PM standards are transferrable to the portfolio management model with few modifications. However, one area where the transition will be difficult is in the domain of Governance, where we assessed a BTI rating of 3.0-meaning, all tasks in this domain classify as a high BTI. Currently, all DOD personnel structures, policies, and procedures are set for a program-centric model of Governance. The DOD will need to modify personnel structure, current governance policies, and associated procedures towards a portfolio-centric structure to transition to a portfolio management structure. Changes in the domain of Governance will allow for changes across all domains analyzed in this study.

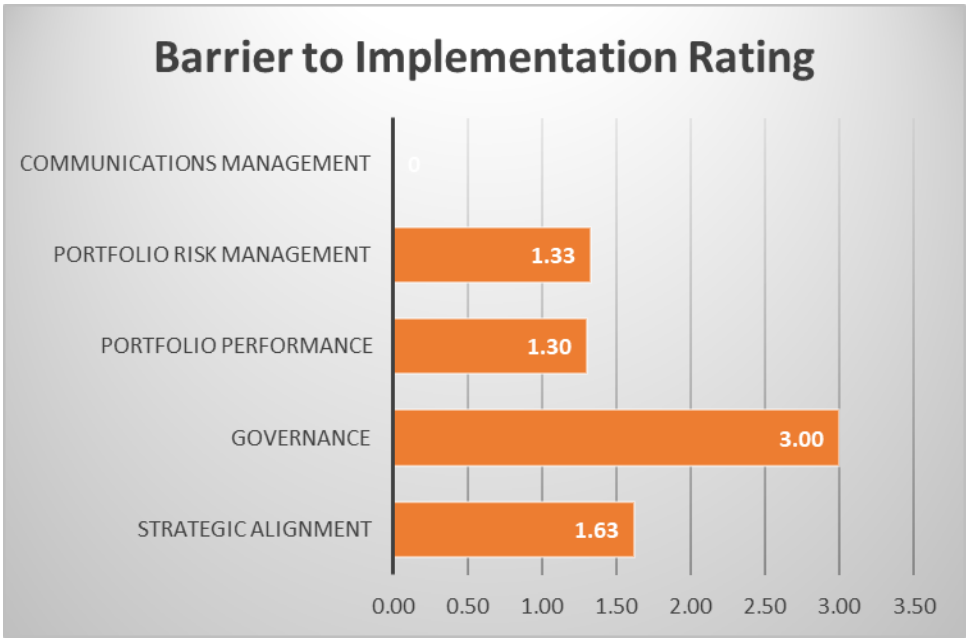

Figure 7. BTI Breakdown by PfMP Domain.

Figure 8 shows the distribution of observed BTI task ratings. In four out of the five domains, the highest BTI rating was a 2. BTI ratings of low or medium were observed in 69% of the data, while a high BTI was recorded in 14%.

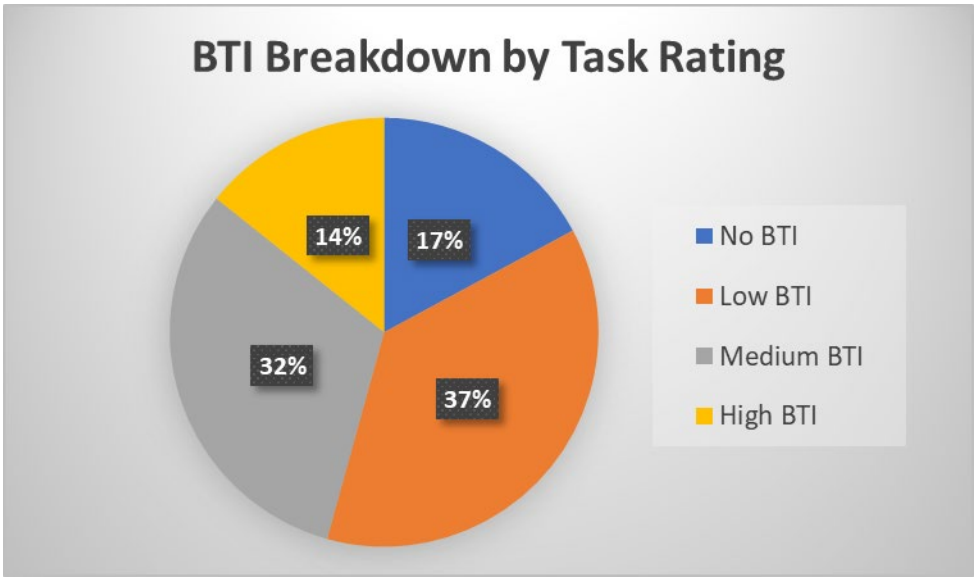

Figure 8. BTI Distribution.

Table 18 depicts the breakdown of BTI ratings by individual task. It also shows the relationship between alignment score and BTI rating. While low alignment scores do not automatically mean medium or high BTI ratings, we did observe a -0.731 correlation between the data sets. This means that, in general, as alignment scores decreased, BTI ratings increased and vice versa. These results further indicate significant gaps in the DOD standards related to Governance, with low to medium barriers to entry across the remaining domains.

Table 18. BTI Rating by Domain and Task.

BTI Rating by Domain and Task		
Domain 1: Strategic Alignment		
Task #	**Alignment Score**	**BTI Rating**
1	50%	1
2	0%	2
3	0%	2
4	50%	2
5	0%	1
6	0%	1
7	0%	2
8	50%	2
Average BTI Rating		**1.63**
Domain 2: Governance		
Task #	**Alignment Score**	**BTI Rating**
1	0%	3
2	0%	3
3	0%	3
4	0%	3
5	0%	3
Average BTI Rating		**3.00**
Domain 3: Portfolio Performance		
Task #	**Alignment Score**	**BTI Rating**
1	0%	2
2	50%	1
3	100%	1
4	100%	1
5	100%	1
6	0%	2
7	0%	1
8	0%	2
9	0%	1
10	0%	2
Average BTI Rating		**1.30**
Domain 4: Risk Management		
Task #	**Alignment Score**	**BTI Rating**
1	100%	1
2	100%	1
3	0%	2
4	0%	1
5	100%	1
6	0%	2
Average BTI Rating		**1.33**
Domain 5:Communications		
Task #	**Alignment Score**	**BTI Rating**
1	100%	0
2	100%	0
3	100%	0
4	100%	0
5	100%	0
6	100%	0
Average BTI Rating		**0.00**

D. CONCLUSION

This chapter covered the results of our gap analysis and BTI analysis. It included quantitative results of the gap analysis and a detailed qualitative breakdown of the gaps in the DOD standard by each domain of the PfMP standard. The following chapter provides analysis, recommendations, and conclusions of the study outlined in this chapter.

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V. FINDINGS, CONCLUSIONS, AND OPPORTUNITIES FOR FUTURE RESEARCH

This chapter includes the findings, conclusions, and opportunities for future research based on our literature review and presentation of our gap and BTI analysis. In presenting our findings, we answer the initial research questions posed at the beginning of the study. In Conclusions, we offer potential solutions to remedy the problems our research identified. We end the paper by offering suggestions for future research based on our findings.

A. FINDINGS

Here we break down our findings and explain the significance of each research question.

(1) Are there gaps in the DOD project management competency standards that must be addressed before the DOD can fully implement PPM as directed in the NDAA of 2021?

Our study suggests significant gaps in the DOD project management competency standards that must be addressed before the DOD can fully implement PPM as directed. The most significant gaps are in the domain of Governance. These findings are consistent with the Section 809 panel, GAO reports, and RAND studies examined during our literature review. Currently, DOD acquisitions operates on a program-centric model that stovepipes funding into specific programs. That money cannot be moved laterally within other programs. Moreover, DOD PMs have little insight and influence into the acquisition program baselines of adjacent PMs within the same PEO or other PEOs (Shultz, 2020).

In the Governance domain, the PfMP standard calls for personnel to "define and establish a governance model, policies, and decision-making roles" (PMI, 2013, p. 5). For the DOD, this would require significant restructuring and policy reform. Most importantly, portfolio managers' authorities, roles, and responsibilities must be worked out and codified to incorporate the tasks outlined in the Governance domain. Once the structure is in place, the PfMP standard outlines the need for each portfolio manager to enact a "portfolio

management plan" (PMI, 2013, p. 5). This includes authoritative thresholds, risk tolerance levels, key performance indicators, prioritization models, and escalation procedures within each portfolio. While similar considerations exist inside many programs, the infrastructure does not currently exist at the portfolio level within the DOD. Moreover, since many of these topics deal with funding at the congressional level, change will be difficult.

The second domain in which the DOD has significant gaps in project management standards is Strategic Alignment. This PfMP domain calls for leaders to make and evaluate organizational goals and marry them to portfolios (PMI, 2013). Again, since the structure, protocols, authorities, and procedures for effective PPM do not currently exist at the portfolio level within the DOD, a cohesive strategy cannot be enacted.

Once the goals align with portfolios, the PfMP standard calls for portfolio managers to set prioritization criteria using tangible analytical decision-making tools and modeling. These inputs from the portfolio management team result in a portfolio road map. This road map is used to budget, plan, and execute. Every asset that the portfolio adds or subtracts is aligned to a task or capability in the road map. The PfMP standard calls for impact analysis of shortfalls within the portfolio road map (PMI, 2013). This is again consistent with our literature review. Shultz (2020) discussed analyzing each asset against the portfolio's key tasks. This process is referred to as "gating." Meaning, the portfolio team briefs decision-makers on how the asset fits in the portfolio, the costs, the risk, and other pertinent details. And, if the asset meets the established criteria, the program moves forward.

In all, portfolio management requires a higher echelon of training. This is somewhat captured in the PMT 4020 course. However, to fully incorporate the domains of Governance and Strategic Alignment, authorities and responsibilities will need to be further decentralized to the PEO level. For PEOs to perform and be evaluated on these key domains properly, they must receive adequate training through a properly developed career field or career path competency structure. Establishing PfMP competency standards will not fully resolve these shortfalls due to the various other policy and structural changes that will require reform. However, educating, training, and evaluating acquisitions professionals on incorporating the proper aspects of Governance and Strategic

Alignment—based on PfMP competency standards—will be essential to moving forward with a portfolio-centric approach.

(2) Where are the DOD and PMI aligned regarding competency standards?

The DOD and PMI standards were fully aligned in the domain of Communications Management. The tasks in this domain center around leadership, developing leaders, and developing rapport with vendors. While Governance is a current weakness regarding the DOD transition to PPM, Communications Management is the strength that can enable forward momentum for the DOD to overcome BTIs to make swift and efficient progress towards full transition. We see this as an area within the PM competency standards that does not need to be duplicated within DOD PfMP standards. Instead, we see the PM competency standards as the natural foundation for moving to the more advanced aspects of PfMP. We will discuss this finding more in the Conclusions section.

Portfolio Risk Management was the next closest aligned domain at 50%. The current competency standards capture the understanding, planning, and mitigating of risk thoroughly. However, adding the higher lens from the portfolio level is essential for effective portfolio risk management. In this regard, the DOD needs to continue to develop standards that capture this increased awareness of risk and how changes in one program can increase or decrease risks in an adjacent program within a portfolio. Under the current model, stove piped programs often lack the proper coordination and awareness of adjacent programs.

The final area in which some alignment was observed was in Portfolio Performance—specifically, in tasks dealing with accountability, maintaining high standards, and making well-informed and timely decisions. These competencies are central to basic military standards and culture and are currently trained to and evaluated in PM competency standards. These tasks will carry over well to the PPM construct in the future. Areas in which the DOD must improve include the creation of portfolio road maps, balancing and optimizing portfolio resources, and analyzing portfolio performance against strategic goals.

(3) What barriers exist regarding the implementation of national standards?

The results of our study suggest that the most significant BTIs reside in the Governance domain. This is a result of the current program-centric construct called for by the Goldwater-Nichols Act that established the Under Secretary of Defense for Acquisition and resulted in the construct we have today (Section 809 Panel, 2019a). It divides the acquisitions process into three subsections: Joint Capabilities Integration and Development System (JCIDS), which is under the cognizance of the Joint Staff; Planning, Programming, Budgeting, and Execution (PPBE), administered by the director of Cost Assessment and Program Evaluation and the DOD comptroller; and Acquisitions, which is administered by acquisitions workforce personnel. Figure 9 outlines the governing documents for each subsection of the DAS. The disjointed nature of this construct will be the most significant barrier to implementation of PPM. This is also consistent with the Section 809 Panel's (2019a) analysis of the DAS.

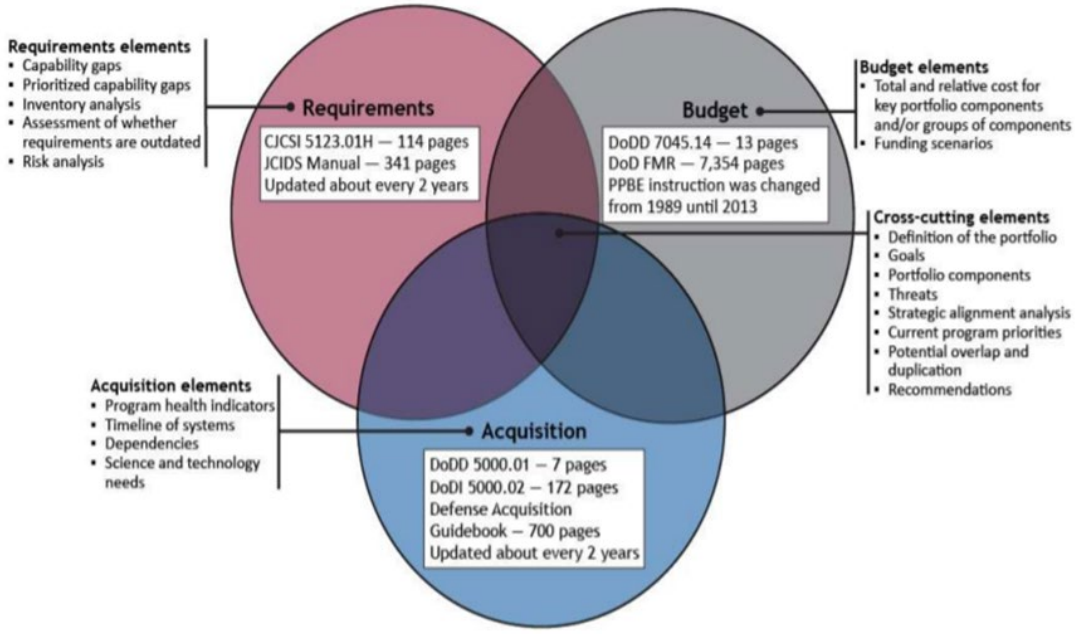

Figure 9. DAS Governing Documents. Source: Section 809 Panel (2019a, p. 66).

B. CONCLUSIONS

Our results do not suggest that the DOD is incapable of conducting portfolio management. Instead, in conducting portfolio management, the DOD relies on PM competency standards that do not align with industry best practices and are based on a fundamentally different strategy. The DAS is not currently structured to provide the appropriate training, education, evaluation, and feedback for proper job performance within a portfolio management-centric strategy. We recommend that defense acquisitions professionals and policy-makers review our analysis and formulate either Portfolio Management Career Field Functional Competencies or Career Path Competencies to further DOD professional standards, develop the necessary job skills and evaluation criteria, and further the process of achieving congressional mandates for portfolio management implementation. We see the establishment of PPM competencies, based on proven industry standards, as a vital component to a successful implementation of congressional mandates to move towards a portfolio management-centric acquisitions strategy. After all, competencies are essential "to perform work roles or occupational functions successfully" (OUSD[A&S], 2019, p. 34). The potential success of any policy changes will hinge on the individual and collective competencies of the acquisitions professionals that are charged with executing them.

In accordance with this proposed change, the DOD and the DAU should modify their structure to recognize "portfolio manager" as either an official career field or career path. This is consistent with the Section 809 Panel recommendations, which assigned these responsibilities and authorities to portfolio acquisitions executives (PAE; Section 809 Panel, 2019a). This billet is analogous to the current PEO, except with expanded responsibilities, authorities, and additional training. Once the career field or path is established, the services can work to establish the requisite billets. These billets should be equal to a command billet, and PAEs should be manned and equipped to accomplish the full array of acquisitions tasks, as seen in Figure 10.

Concurrently, the services should select and fund select acquisitions professionals to obtain PfMP certification from PMI. Once complete, the PM FL should select a number of these individuals to become members of the PM FIPT and/or PM working group to assist

in implementing PPM within the DOD. Until structure, policies, and procedures can officially change, the DOD should continue to send personnel to PMI to receive PfMP training. Figure 10 shows a notional structure proposed for PPM in defense acquisitions as recommended by the Section 809 Panel.

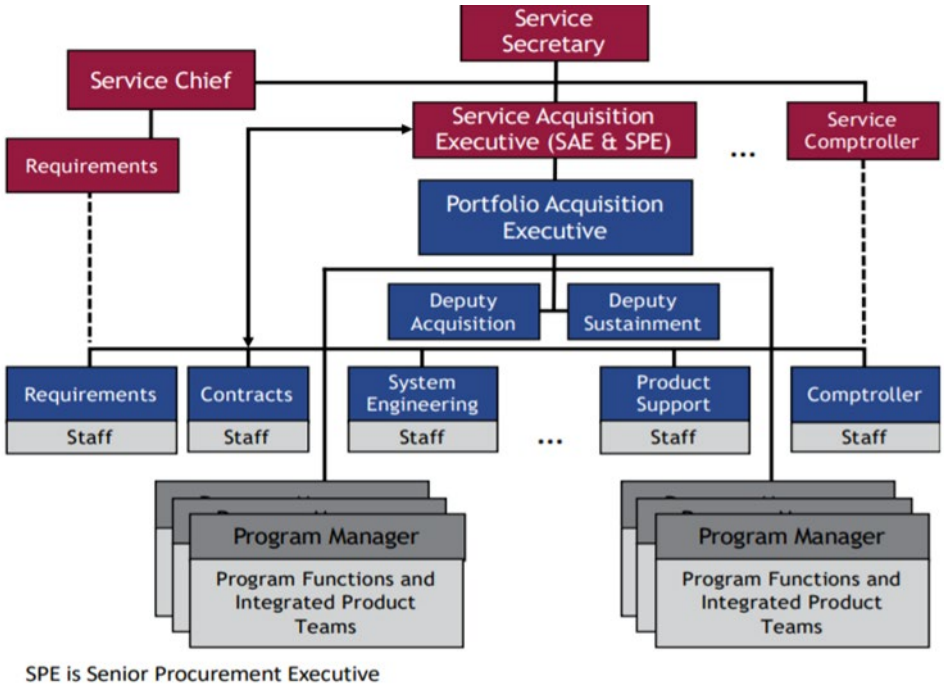

Figure 10. Notional Portfolio Manager Command Structure. Source: Section 809 Panel (2019a, p. 62).

The second task of the PM FIPT and/or PM working group should be to coordinate with the DAU to implement a training program for portfolio management. It should mirror the PfMP, adapted only where required to fit the needs of the DOD. The DOD should consult industry professionals and other trusted agents to modernize DOD practices to accomplish this task. The simplest option to accomplish this is by adding a Level IV training to the already existing DAU structure.

The transition to portfolio management is an opportunity to increase collaboration amongst the services, achieve commonality, and reduce redundancies. This is also consistent with the Section 809 Panel recommendations, which include establishing

Enterprise Capability Portfolios. This involves working in a joint manner on all things related to assets such as battlespace awareness tools, logistics, command and control, and myriad other common tasks. This enables the military to better organize for innovation, streamline delivery of essential items, reduce redundancy amongst the services, and increase commonality (Section 809 Panel, 2019a). Some of these actions are already occurring within the DOD; however, they are being executed while operating within the PM-centric strategy. Figure 11 is an example of how this can look under a portfolio management-centric structure, and in some cases, it is already being tested. PEOs, or future PAEs, at the service level are integrated and collaborating with Enterprise Capability Portfolios at the joint level.

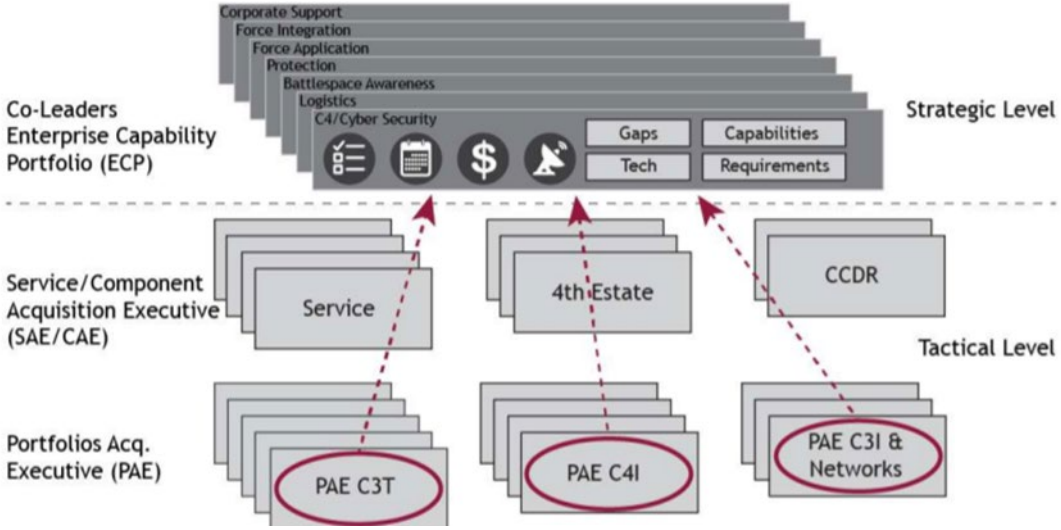

Figure 11. Notional Joint (Enterprise) Portfolio Management Structure.
Source: Section 809 Panel (2019a, p. 69).

Last, a commission must be formed to address funding authorities within defense acquisitions at the congressional level. Table 19 shows the current authorities PEOs have for reprogramming funding for appropriation, R&D, and procurement. In FY2014, PEOs had only 2% flexibility in R&D and less than 1% for procurement. That means 98% of the time or more, PEOs had to seek congressional approval to make changes. Without a significant overhaul and increased authorities, PPM cannot be implemented. Portfolio

managers should be given MDA whenever feasible and be allowed to manage costs, schedule, and performance within their portfolios. They, instead of lawmakers, should manage and execute programs and capabilities. Additionally, they should be granted the latitude to execute an R&D budget as they see fit without seeking congressional approval. The speed of technological change is too fast to be slowed by excessive bureaucracy.

Table 19. Appropriation Limits. Source: Section 809 Panel (2019a, p. 57).

	PEO Authority	Congressional Approval	MDAP Baseline	% of MDAP Baseline
Appropriation	Below Threshold Reprogramming (BTR)	Above Threshold Reprogramming (ATR)		
Research, Development, Test and Evaluation (RDT&E)	$10M or 20% (whichever is less)	Above $10M or 20%	$480M	2.0%
Procurement	$20M or 20% (whichever is less)	Above $20M or 20%	$2,790M	0.7%

C. RECOMMENDATIONS FOR FURTHER RESEARCH

Recommendations for further research include the following topics or research areas:

1. **Barriers to Implementation:** We recommend a more comprehensive review of barriers to implementation from a specific policy, budget, and personnel management lens to further identify and recommend appropriate adjustments to existing policy, budget, and/or personnel structure to ensure the shift to portfolio management is sustainable and consistent.

2. **Manpower Implications:** As our findings and conclusions are tailored specifically to a gap analysis of existing standards, the next step after drafting a revised list of standards is to fully evaluate the impacts of the policy change. A full troop-to-task should be completed to assess the personnel requirements necessary to fully implement PPM within the

DOD. This will likely be the most complex and contentious issue surrounding the shift from program to portfolio management.

3. **Budgetary Implications:** A fiscal review will be necessary to capture the cost required to incorporate the recommended changes to facilitate policy changes. This could include calculations of additional PPM curriculum costs including, for example, the hiring of additional acquisitions professional educators trained in portfolio management for the acquisitions training pipeline, the cost of PfMP certification training for DAU professionals, as well as other associated requirements to implement new PPM competency standards across the acquisitions community. Furthermore, additional research will be required to assess the fiscal impacts to implementation, incorporating a thorough cost/benefit analysis of PPM implementation. Last, a detailed study should be conducted regarding potential changes to current fiscal policy that are needed to implement a portfolio management-centric strategy.

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