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Program Management Versus Portfolio Management in Defense Acquisition

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Abstract

This research performed 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 acquisition. Current DoD program management standards are compared to the Project Management Institute's Portfolio Management Professional certification standards to analyze alignment and gaps between the standards. Barrier to Implementation (BTI) scores are assigned to address the identified gaps in the DoD standard. The study found that the DoD program management competencies are on average 41% aligned with portfolio management industry standards. The DoD program management competencies are least aligned with the portfolio management domains of governance and strategic alignment. The composite BTI score indicates low to medium level of implementation barriers for most of the gaps. Results indicate that the DoD is capable of conducting PPM, and further research is needed to fully align the current competency standards with industry best practices. Defense acquisition senior leaders should consider formulating DoD portfolio management career field functional competencies to address congressional mandates for portfolio management implementation within the DoD.

Keywords: portfolio management, program management, gap analysis, NDAA acquisition guidance, acquisition reform and innovation

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) within Defense acquisitions and necessitates study of the alignment between existing PM competency standards with product portfolio management (PPM) and the overall construct of corporate portfolio management (CPM). The research performs 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 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, acquisition career fields established by Defense Acquisition Workforce Improvement Act (DAWIA) and managed by the Services' Directors of Acquisition Career Management (DACMs) do not formally recognize portfolio manager as a career field separate

and distinct 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 Government Accountability Office (GAO) have been advocating for PPM for 20 years, change has been slow to come (Ahern & Driessnack, 2019; 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. 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. Identifying gaps in the competency standards will assist in updating and codifying a standard that can be used as a common thread to synchronize PPM efforts across the Defense 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. A similar situation exists in the private sector where 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 CPM principles and 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).

The research questions included the following:

- 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?
- Where are the DoD and Project Management Institute (PMI) aligned regarding competency standards?
- What barriers exist regarding the implementation of PPM standards for Defense acquisitions?

The research 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. Lastly, 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 and FY2021 NDAAs (NDAA, 2019, 2021).

The scope of this research was 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. Structural, budgetary, statutory, and design implications may exist in implementing the shift from program-centric to portfolio management that require further research.

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 FY2021 NDAA requirements.

Background and Literature Review

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, business cases are created, reviewed and "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 project 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" (Project Management Institute [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 and diverse 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.
(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.

Within 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. 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)

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.

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 OUSD(A&S). 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 (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. The DoD further breaks down the structure of competencies and their interaction with the education realm from this overarching framework. In 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). As a result of DAWIA,

the government created the DAU and assigned it to provide training for acquisition professionals.

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 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 (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 two-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.

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). Figure 1 shows the relationship between the disciplines of project, program, and portfolio management. The PMI Project Management Professional (PMP) and Program Management Professional (PgMP) certifications are widely recognized and feed into the PMI Portfolio Management Professional (PfMP) certification.
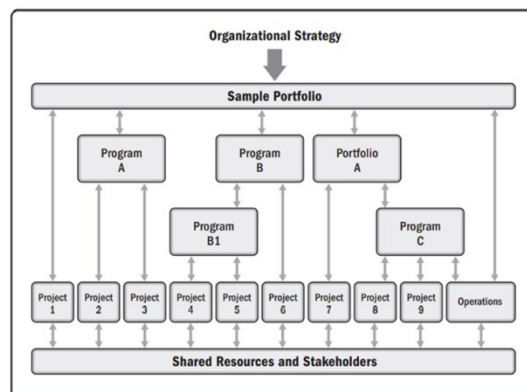

Figure 1. Portfolios, Programs, and Projects: High-Level View.
(PMI, 2017b, p. 4).

The PfMP certification is one of the most rigorous offered and requires an extensive amount of experience. PfMP applicants must have a minimum of eight years of professional business experience and four to seven years of unique nonoverlapping professional 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). Once the application is complete, a panel of

volunteer portfolio managers worldwide review the application and make the accession decision. If accepted, the candidate has one year to study for and pass the PfMP exam. Once a candidate has achieved PfMP certification, they must report 60 professional development units (PDUs) every three years.

PMI delineates the PfMP certification from the others it offers by chartering an independent third-party study every five to seven 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 2 (PMI, 2017b). However, for certification purposes, PMI only tests on five domains—including Strategic Alignment, Governance, Portfolio Performance, Portfolio Risk, and Communication (as shown in Figure 2). These five domains and their numerous competencies form the basis of our analysis and research.
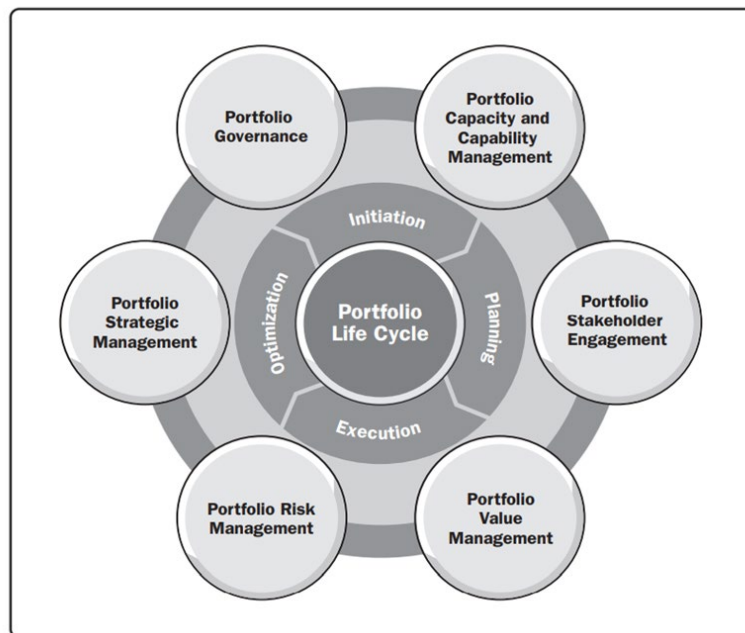

Figure 2. Portfolio Management Performance Domains.
(PMI, 2017b, p. 10).

Methodology

This research used mixed quantitative and qualitative methods. Specifically, a competency gap analysis was conducted 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 first two research questions:

- 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?

- Where are the DoD and Project Management Institute (PMI) aligned regarding competency standards?

To answer the third research question—What barriers exist regarding the implementation of PPM standards for Defense acquisitions?—the assessed gaps were assessed into three qualitative categories based on perceived barriers to implementation (BTI), and 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 acquisitions must alter either personnel or policy to address the gap adequately. Finally, barriers assessed as high indicate that Defense acquisitions 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 this analysis. To capture and assess the current state of operations, we used the DoD PM Career Field Functional Competencies (DAU, 2020). The 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. 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, the use of the PfMP Examination Content Outline (PMI, 2013) as the "ideal state" ensured that the DOD is basing the defense acquisitions education and training curriculum on the industry's leading competency content while meeting congressional mandates from NDAA requirements.

Data Sources

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

The DoD Program Management Career Field Functional Competencies served as our primary data source for DoD competency standards (DAU, 2020). They consist 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 2 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. 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. The four competency units are further broken down into 18 units of competency (UOC)/topics, 69 competencies, and 184 competency elements/sub-competencies.

Table 2. Program Management Competency Units, Topics, and Competencies.
(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 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 with the goal of DoD PM Career Field Competency Standards (DAU, 2020). 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 3. 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. Appendix A provides the detailed explanation of the tasks within the portfolio management domains.

Table 3. Portfolio Management Professional Examination Domains and Weights.
(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%

Qualitative Analysis of Data

A lexicographic analysis of keywords and the principal purpose of each DoD PM competency was matched to each of the PMI PfMP domains and tasks. Karnes's (2020) work on aligning PM competencies with PMI standards informed our approach; however, the goal of the gap analysis was to analyze the current state of operations (PM competency standards) to the ideal state (PMI PfMP domains and tasks). This research 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 unnecessarily modified standards.

A competency alignment matrix with three classifications of alignment was created: 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). 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. The assessment of alignment was based on the following criteria:

- 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.

After reviewing and matching all applicable DoD PM competency standards to the PMI domains and tasks, BTI scores were assessed. 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 included the following:

- No BTI as practices that already occur within the DoD.
- Low BTI as changes that the DoD could implement immediately with little to no change in personnel structure or additional policy concerns.
- Medium BTI as changes that would require either significant changes in policy or personnel structure.
- High BTI as changes that would require both significant personnel and policy changes.

Quantitative Analysis of Data

To assess a quantitative measure of alignment, the following Alignment Score scale was defined:

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

Each PMI PfMP task was assessed an alignment score based on the qualitative assessment. Within each PfMP domain, average score were calculated (i.e., the total score of all tasks divided by the total number of tasks within the domain). The average scores indicate 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, the following Barrier to Implementation Rating scale was defined:

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

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

Results

Overall Alignment

Table 4 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 critical 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 4. 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%

Detailed Alignment Analysis by Domain

Table 5 depicts the detailed view of the analysis in the Strategic Alignment domain. Partial alignment existed 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 5. Strategic Alignment Domain Comparison

The most significant gaps in the DOD competency standard regarding portfolio management are related to the Governance domain. As shown in Table 6, 0% alignment in this domain was observed. 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 6. Governance Domain Comparison

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

In the domain of Portfolio Performance, the DoD competency standard was 35% aligned with the PfMP standard. Full alignment was observed in three of the 10 tasks and partial alignment in one. As shown in Table 7, 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 or educate personnel on balancing, prioritizing, or optimizing funding across a portfolio, which is a central theme in portfolio management.

Table 7. Portfolio Performance Comparison

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

As depicted in Table 8, 50% alignment was observed 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 8. Portfolio Risk Management Comparison

Domain 4: Portfolio 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	

Table 9 shows the alignment of the two standards in the domain of Communications Management. In this domain, 100% alignment was observed. 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 9. 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.		(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		0	
4	Maintain the communication strategy and plan by evaluating current communications capabilities, identifying gaps, and documenting communications plan to meet stakeholder requirements.	EL1	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.	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.		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	
6	Verify accuracy, consistency, and completeness of portfolio communication, utilizing governance guidelines, to maintain credibility and satisfaction with all stakeholders.			1		0	

Barriers to Implementation (BTI) Analysis

Figure 3 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 observed 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, 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 research.
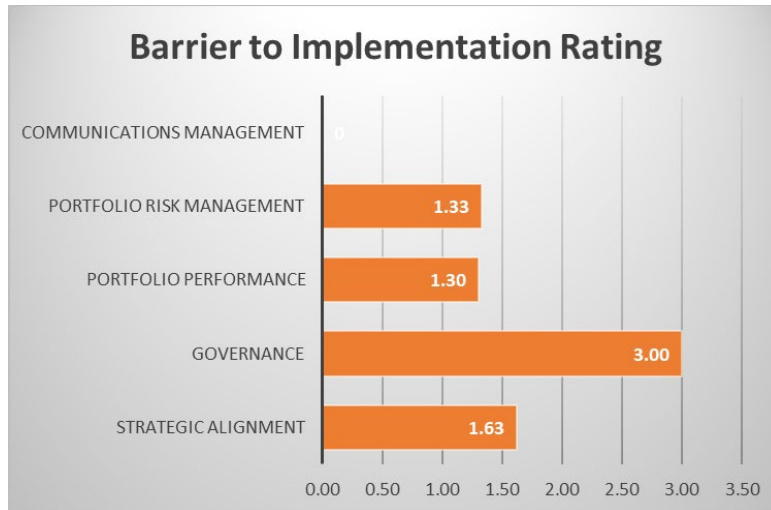
Figure 3. BTI Breakdown by PfMP Domain

Figure 4 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%.
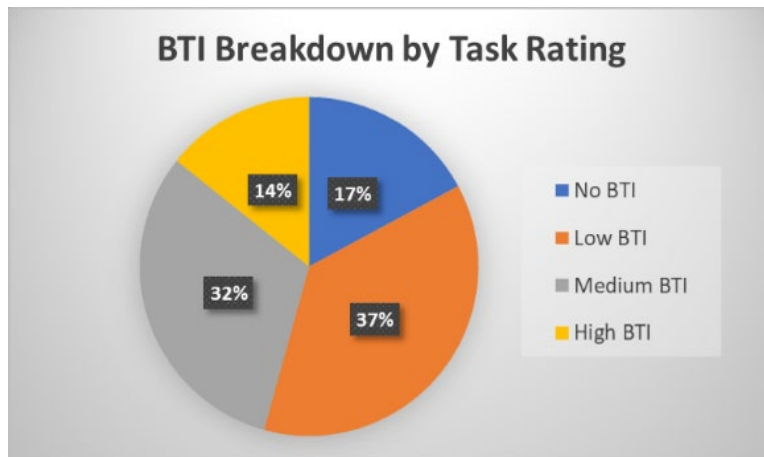

Figure 4. BTI Distribution

Table 10 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, a -0.731 correlation between the data sets was observed. 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 10. 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

Summary and Conclusions

Summary Findings

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 2021 NDAA?

The analysis indicates 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 recommendations from the Section 809 panel and GAO reports. Currently, DoD acquisitions operates on a program-centric model that stovepipes funding into specific 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 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.

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). Without the structure, protocols, authorities, and procedures for effective PPM at the portfolio level within the DoD, a cohesive strategy cannot be developed. Once the goals align with portfolios, the PfMP standard calls for portfolio managers to set prioritization criteria using analytical decision-making tools, resulting in a portfolio road map used to budget, plan, and execute. The PfMP standard calls for impact analysis of shortfalls within the portfolio road map (PMI, 2013). Shultz (2020) discussed analyzing each program and project against the portfolio's road map.

Portfolio management requires a higher echelon of training and education, which partially covered in executive-level DAU training. However, to fully incorporate the domains of governance and strategic alignment, authorities and responsibilities will need to be decentralized to the PEO level. For PEOs to perform and be evaluated on these key domains properly, they must receive adequate training and education supported by clearly defined career field competency models. 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.

Research Question #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. Communications management competency is the strength that can enable forward momentum for the DoD to overcome BTIs to make swift and efficient progress towards transition. This is an area within the PM competency standards that does not need to be duplicated within DoD PfMP standards.

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, stovepiped 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.

Research Question #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 resulted in the basic governance construct still in place (Section 809 Panel, 2019a). It divides the acquisition governance into three decision support systems: requirements [Joint Capabilities Integration and Development System (JCIDS) for formal programs of record]; resourcing [Planning, Programming, Budgeting, and Execution (PPBE) system]; and the Adaptive Acquisition Framework. Each of these decision support systems is fundamentally driven by different and often contradictory goals:

- The requirements generation system is driven primarily by a combination of capability needs and an evolving threat—pointing toward the need for a responsive acquisition system.
- The resource allocation system is calendar-driven, with Congress writing an appropriations bill and the president signing the bill every fiscal year—providing control of funding to the Congress and transparency to the American public and media for taxpayer money.
- The Adaptive Acquisition Framework is event-driven by milestones—based on commercial industry best practices of knowledge points and off-ramps supported by the design, development and testing of the systems as technology, system design and manufacturing processes mature.

The disjointed nature of this construct will be the most significant barrier to implementation of PPM. These finding are consistent with the Section 809 Panel's (2019a) analysis.

This analysis does not indicate 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. Defense acquisitions are not currently structured to provide the appropriate training, education, evaluation, and feedback for proper job performance within a portfolio management-centric strategy. The establishment of PPM competencies remains a vital component to a successful implementation of congressional mandates to move towards a portfolio management-centric acquisitions strategy.

The DoD should consider modifying its governance structure to recognize "portfolio manager" as an official career field. This is consistent with the Section 809 Panel recommendations, which assigned these responsibilities and authorities to portfolio acquisitions executives (PAE; Section 809 Panel, 2019a). The PAE construct is analogous to the current PEO, except with expanded responsibilities and authorities. Concurrently, the Services should support acquisitions professionals obtaining PfMP certifications and include PfMP certification in the requirements for key acquisition positions. Figure 5 shows a notional structure proposed for PPM in defense acquisitions as recommended by the Section 809 Panel.
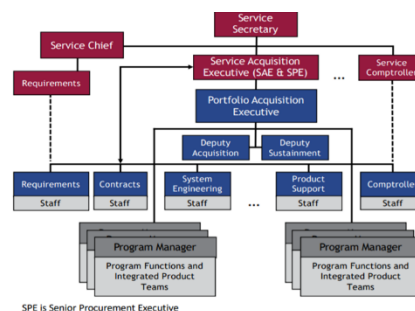

Figure 5. Notional Portfolio Manager Structure.
(Section 809 Panel, 2019a, p. 62).

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 related areas such as battlespace awareness tools, logistics, or command and control. This enables the DoD to better organize for innovation, streamline delivery of essential items and reduce redundancy amongst the Services (Section 809 Panel, 2019a). Figure 6 is an example of how this can look under a portfolio management-centric structure. PEOs, or future PAEs, at the service level are integrated and collaborating with Enterprise Capability Portfolios at the joint level.
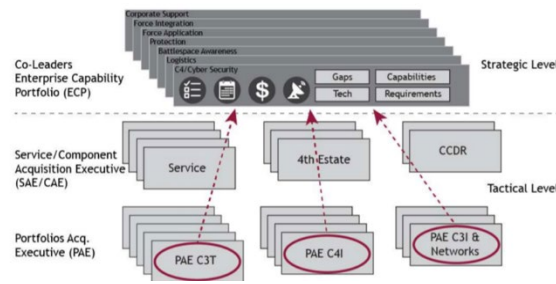

Figure 6. Notional Joint (Enterprise) Portfolio Management Structure.
(Section 809 Panel, 2019a, p. 69).

Lastly, future research should address funding transfer authorities within defense acquisitions and the establishment of portfolio elements for budgeting rather than program elements (PE's). Portfolio managers should be given milestone decision authority of assigned programs and projects and be allowed to manage cost, schedule, and performance within a portfolio acquisition baseline as opposed to an acquisition program baseline (APB).

References

Ahern, D., & Driessnack, J. (2019, June 30). *Implementing a multitier portfolio management structure for defense acquisition.* Olde Stone Consulting. http://www.oldestoneconsulting.com/blog/2019/6/30/implementing-a-multitier-portfolio-management-structure-for-defense-acquisition

Anton, P., McKernan, M., Munson, K., Kallimani, J., Levedahl, A., Blickstein, I., Drezner, J., & Newberry, S. (2019). *Assessing Department of Defense use of data analytics and enabling data management to improve acquisition outcomes* (Report No. RR-3136-OSD). RAND Corporation. https://www.rand.org/pubs/research_reports/RR3136.html

Biedenbach, T., & Müller, R. (2012). Absorptive, innovative, and adaptive capabilities and their impact on project and project portfolio performance. *International Journal of Project Management, 30*(5), 621–635. https://doi.org/10.1016/j. ijproman.2012.01.016

Chairman of the Joint Chiefs of Staff. (2018, August 31). *Charter of the Joint Requirements Oversight Council (JROC) and implementation of the Joint Capabilities Integration and Development System (JCIDS)* (CJCSI 5123.01H). Joint Staff. https://www.jcs.mil/Portals/36/Documents/Library/Instructions/CJCSI%205123.01H.pdf?ver=2018-10-26-163922-137

Defense Acquisition University. (n.d.). *Certification standards & core plus development guide: Program management level III.* Retrieved October 6, 2021, from https://icatalog.dau.edu/onlinecatalog/CareerLvl.aspx?lvl=3&cfld=9

Defense Acquisition University. (2020, June). *DOD program management career field functional competencies.* https://icatalog.dau.edu/onlinecatalog/Doc/CFcompetencys/PMCompetencies.pdf

Defense Acquisition University. (2021, August 17). *PMT 4020 Executive program manager's course.* https://icatalog.dau.edu/onlinecatalog/courses.aspx?crs_id=12460

Distel, D., Hannon, E., Krause, M., & Krieg, A. (2020, December 7). *Finding the sweet spot in product portfolio management.* McKinsey & Company. https://www.mckinsey.com/business-functions/operations/our-insights/finding-the-sweet-spot-in-product-portfolio-management

Ewing, L., Dell, R., MacCalman, M., & Whitney, L. (2013, January). *Capability portfolio analysis tool (CPAT) verification and validation report* (Report No. NPS-OR-13-001). Naval Postgraduate School. https://calhoun.nps.edu/handle/10945/27340

Fast, W. (2010). Improving defense acquisition decision making. *Defense AR Journal, 17*(2), 220–241. http://libproxy.nps.edu/login?url=https://www-proquest-com.libproxy.nps.edu/scholarly-journals/improving-defense-acquisition-decision-making/docview/220023524/se-2?accountid=12702

GAO. (2015, August). *Report to congressional committees: Weapon system acquisitions: Opportunities exist to improve the Department of Defense's portfolio management* (GAO-15-466). https://www.gao.gov/assets/gao-15-466.pdf

GAO. (2020, June 3). *Defense acquisitions annual assessment: Drive to deliver capabilities faster increases importance of program knowledge and consistent data for oversight* (GAO-20-439). https://www.gao.gov/products/gao-20-439

Gutiérrez, E., & Magnusson, M. (2014). Dealing with legitimacy: A key challenge for Project portfolio management decision-makers. *International Journal of Project Management, 32*(1), 30–39. https://doi.org/10.1016/j.ijproman.2013.01.002

Heising, W. (2012). The integration of ideation and project portfolio management: A key factor for sustainable success. *International Journal of Project Management, 30*(5), 582–595. https://doi.org/10.1016/j.ijproman.2012.01.014

Janiga, M., & Modigliani, P. (2014, November–December). Think portfolios, not programs. *Defense AT&L Magazine, 43*(6), 12–16. https://dair.nps.edu/bitstream/123456789/3013/1/SEC809-RSC-14-0038.pdf

Johnson, M. (2019). Section 809 Panel: Hacking away at the regulatory underbrush and empowering the acquisition workforce. *Contract Management, 59*(5), 12–13. https://www-proquest-com.libproxy.nps.edu/docview/2278736758?accountid= 12702

Karnes, J. L. (2020, December). *Aligning DoD program management competencies with the Project Management Institute standards* [Master's thesis, Naval Postgraduate School]. Defense Acquisition Innovation Repository. https://dair.nps.edu/bitstream/123456789/4298/1/NPS-PM-21-009.pdf

Kendall, F. (2017). *Getting defense acquisitions right.* Defense Acquisition University Press. https://dod.defense.gov/Portals/1/Documents/pubs /Getting-Acquisition-Right-Jan2017.pdf

Kock, A., Schulz, B., Kopmann, J., & Gemünden, H. G. (2020). Project portfolio management information systems' positive influence on performance: The importance of process maturity. *International Journal of Project Management, 38*(4), 229–241. https://doi.org/10.1016/j.ijproman.2020.05.001

Langford, G., Franck, R., Huynh, T., & Lewis, I. (2008, April). *Gap analysis: Rethinking the conceptual foundations.* Naval Postgraduate School. http://hdl.handle.net/10945/33274

Li, Y. M., Chen, H. M., Liou, J. H., & Lin, L. F. (2014). Creating social intelligence for product portfolio design. *Decision Support Systems, 66*, 123–134. https://doi.org/10.1016/j.dss.2014.06.013

MacStravic, J. A. (2016, September 6). *Program management functional career field competencies* [Memorandum]. Department of Defense. https://www.dau.edu/training/career-development/program-management/Lists/Blog/Attachments/29/Prog%20Mgmt%20Funct%20Competencies_160906%20(003).pdf

Modigliani, P. (2015, April 1). *Portfolio acquisition: How DoD can leverage the commercial product line model.* Naval Postgraduate School. https://calhoun.nps.edu/handle/10945/53650

National Defense Authorization Act for Fiscal Year 2020, Pub. L. No. 116-92, Sec. 861 (2019). https://www.congress.gov/116/bills/s1790/BILLS-116s1790enr.pdf

National Defense Authorization Act for Fiscal Year 2021, Pub. L. No. 116-283, Sec. 836 (2021). https://www.congress.gov/116/bills/hr6395/BILLS-116hr6395enr.pdf

Nippa, M., Pidun, U., & Rubner, H. (2011). Corporate portfolio management: Appraising four decades of academic research. *Academy of Management Perspectives, 25*(4), 50–66. https://doi.org/10.5465/amp.2010.0164

Office of the Under Secretary of Defense for Acquisition and Sustainment. (2019, September 13). *Defense acquisition workforce education, training, experience, and career development program* (DoDI 5000.66). Department of Defense. https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/500066.PDF?ver=2019-09-13-063647-267

Office of the Under Secretary of Defense for Acquisition and Sustainment. (2021, April 28). *2020 Acquisition & Sustainment annual report.* https://www.acq.osd.mil/resources/acq/docs/AS2020-Annual-Report-FINAL.pdf

Office of U.S. Congressman Joe Wilson. (2020, July 7). *DoD portfolio management accountability act included in National Defense Authorization Act* [Press release]. https://joewilson.house.gov/media-center/press-releases/dod-portfolio-management-accountability-act-included-in-ndaa

Petit, Y. (2012). Project portfolios in dynamic environments: Organizing for uncertainty. *International Journal of Project Management, 30*(5), 539–553. https://doi.org/10.1016 /j.ijproman.2011.11.007

Pringle, S., & VanOrden, M. A. (2009, March). *Applying modern portfolio theory and the capital asset pricing model to the DoD's information technology investments.* Naval Postgraduate School. https://calhoun.nps.edu/bitstream/handle/10945/4795/09Mar_Pringle.pdf?sequence=1&isAllowed=y

Project Management Institute. (2013). *Portfolio Management Professional (PfMP) examination content outline.*

Project Management Institute. (2017a). *Portfolio Management Professional (PfMP) handbook.*

Project Management Institute. (2017b). *The standard for portfolio management* (4th ed.).

Section 809 Panel. (2017, May). *Advisory panel on streamlining and codifying acquisition regulations: Section 809 Panel interim report.* Defense Technical Information Center. https://discover.dtic.mil/wp-content/uploads/809-Panel-2019/Interim-Report/Sec809Panel_Interim-Report_May2017.pdf

Section 809 Panel. (2018a, January). *Advisory panel on streamlining and codifying acquisition regulations: Volume 1 of 3.* Defense Technical Information Center. https://discover.dtic.mil/wp-content/uploads/809-Panel-2019/Volume1/Sec809Panel_Vol1-Report_Jan2018.pdf

Section 809 Panel. (2018b, June). *Advisory panel on streamlining and codifying acquisition regulations: Volume 2 of 3.* Defense Technical Information Center. https://discover.dtic.mil/wp-content/uploads/809-Panel-2019/Volume2/Sec809Panel_Vol2-Report_Jun2018.pdf

Section 809 Panel. (2019a, January). *Advisory panel on streamlining and codifying acquisition regulations: Volume 3 of 3 part 1.* Defense Technical Information Center. https://discover.dtic.mil/wp-content/uploads/809-Panel-2019/Volume3/Sec809Panel_Vol3-Report_Jan2019_part-1_0509.pdf

Section 809 Panel. (2019b, January). *Advisory panel on streamlining and codifying acquisition regulations: Volume 3 of 3 part 2.* Defense Technical Information Center. https://discover.dtic.mil/wp-content/uploads/809-Panel-2019/Volume3/Sec809Panel_Vol3-Report_Jan2019_part-2_0307.pdf

Section 809 Panel. (2019c, February). *Advisory panel on streamlining and codifying acquisition regulations: A roadmap to the Section 809 Panel reports.* Federal Depository Library Program. https://permanent.fdlp.gov/websites/discover.dtic.mil/discover.dtic.mil/discover.dtic.mil/wp-content/uploads/809-Panel-2019/Roadmap/Sec809Panel_Roadmap_DEC2019.pdf

Shultz, B. (2020, March). A portfolio management–based acquisition model? *Contract Management, 60*(3), 42–47. https://www-proquest-com.libproxy.nps.edu/docview/2458099153?accountid=12702

Thompson, R., & Johnson, M. (2019, July 10). 809 Panel calls for managing "capabilities," not weapons. *Breaking Defense.* https://breakingdefense.com/ 2019/07/809-panel-calls-for-managing-capabilities-not-weapons/

Tolonen, A., Shahmarichatghieh, M., Harkonen, J., & Haapasalo, H. (2015). Product portfolio management: Targets and key performance indicators for product portfolio renewal over life cycle. International Journal of Production Economics, 170, 468–477. https://doi.org/10.1016/j.ijpe.2015.05.034

Tsiopanas, N. (2018, April 4). Smarter acquisition of defense business systems prioritizes results over reviews. *Federal Times.* https://www.federaltimes.com/opinions/ 2018/04/04/smarter-acquisition-of-defense-business-systems-prioritizes-results-over-reviews/

Weller, J. (2018, October 17). *The complete guide to gap analysis.* Smartsheet. https://www.smartsheet.com/gap-analysis-method-examples

Wright, K., Dacanay, C., & Guzman, M. (2020, December). *Implementing category management across United States Special Operations Command (SOCOM)* [Master's thesis, Naval Postgraduate School]. NPS Archive: Calhoun. https://calhoun.nps.edu/bitstream/handle/10945/66747/20Dec_Wright_Dacanay_Guzman.pdf?sequence=1&isAllowed=y

Young, M., & Conboy, K. (2013). Contemporary project portfolio management: Reflections on the development of an Australian competency standard for project portfolio management. *International Journal of Project Management, 31*(8), 1089–1100. https://doi.org/10.1016/j.ijproman.2013.03.005

Appendix A. PMI Portfolio Domain Tasks

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 11.

Table 11. Domain 1: Strategic Alignment Tasks.
(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.

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 five tasks as listed in Table 12.

Table 12. Domain 2: Governance Tasks.
(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.

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 13.

Table 13. Domain 3: Portfolio Performance Tasks.
(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.

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 six tasks listed in Table 14.

Table 14. Domain 4: Portfolio Risk Management Tasks.
(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.

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 six tasks listed in Table 15.

Table 15. Domain 5: Communications Management Tasks.
(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.