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ACQUISITION RESEARCH PROGRAM
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Aligning DoD Program Management Competencies with the Project Management Institute Standards

December 2020

1st Lt. Jonathan L. Karnes, USAF

Thesis Advisors: Dr. Robert F. Mortlock, Professor of the Practice
Raymond D. Jones, Professor of the Practice

Graduate School of Defense Management

Naval Postgraduate School

Prepared for the Naval Postgraduate School, Monterey, CA 93943.

ACQUISITION RESEARCH PROGRAM
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ABSTRACT

This research examines the level of alignment between the Department of Defense's 2016 Program Management Functional Career Field Competencies and the Project Management Institute's Guide to the Project Management Body of Knowledge (6th ed.), The Standard for Program Management (4th ed.), and The Standard for Portfolio Management (4th ed.). This alignment analysis seeks to offer Department of Defense (DOD) agencies like the Defense Acquisition University information and recommendations to effectively fulfill the mandate of the fiscal year 2020 National Defense Authorization Act (NDAA) to base all acquisition workforce certification requirements on nationally or internationally recognized third-party standards. As an American National Standards Institute–accredited third party, the Project Management Institute serves as an optimal resource on which to base the DOD's Program Management certification requirements. The research reviews each DOD Program Management competency element and compares it with the contents of the Project Management Institute's standards to determine each element's level of alignment. This competency mapping process and its subsequent analysis guide the research's recommendations to the Defense Acquisition University.

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ABOUT THE AUTHOR

1st Lt Jonathan Karnes commissioned through the University of Texas at Austin's AFROTC program as a Contracting Officer with a degree in Communication Studies in 2017. Upon commissioning, he was stationed at Joint Base San Antonio, the largest operational contracting squadron in the U.S. Air Force. While serving in San Antonio, his unit was named the Air Force's Most Outstanding Large Contracting Squadron of 2018. Also, in 2018, 1st Lt Karnes pursued advanced education and enrolled in the University of Texas at San Antonio's (UTSA) MBA program. He has maintained concurrent enrollment in the two master's programs throughout his time at the Naval Postgraduate School. While at the Naval Postgraduate School, 1st Lt Karnes obtained his Project Management Professional certification through the Project Management Institute. He has follow-on orders to the Air Force Life Cycle Management Center at Wright Patterson AFB to serve as a contracting officer for the Medium Altitude Unmanned Aerial Systems Division and will be graduating from UTSA with an MBA focusing in Project Management in Spring 2021.

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LIST OF ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
DAU	Defense Acquisition University
DAWIA	Defense Acquisition Workforce Improvement Act
DOD	Department of Defense
DOD IG	Department of Defense Office of Inspector General
FY	fiscal year
JCIDS	Joint Capabilities Integration and Development System
NDAA	National Defense Authorization Act
OASD(A)	Office of the Assistant Secretary of Defense for Acquisitions
OUSD(AT&L)	Office of the Under Secretary of Defense for Acquisition, Technology and Logistics
OMB	Office of Management and Budget
PM	program management
PMBOK	*Project Management Body of Knowledge*
PMI	Project Management Institute
PMIAA	Program Management Improvement Accountability Act
PMP	project management professional
PgMP	program management professional
PfMP	portfolio management professional
PPBE	planning, programming, budgeting, and execution
TSPfM	*The Standard for Portfolio Management*
TSPgM	*The Standard for Program Management*

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I. INTRODUCTION

The purpose of this chapter is to provide the reader with the background, purpose, and methodology for this research project on aligning the program management functional career field competencies of the Department of Defense (DOD) with the standards published by the Project Management Institute® (PMI). The chapter also identifies the research questions that will be addressed and the benefits, scope, and organization of the study.

A. BACKGROUND

For decades, the DOD has been criticized for its inability to responsibly manage the various programs funded by the U.S. taxpayers. These repeated failings in the realms of program cost, schedule, and performance have been documented in numerous reports from the Office of the Secretary of Defense and the Government Accountability Office (GAO), and in a myriad of theses and dissertations (Bond et al., 2016; Choi, 2009; Defense Acquisition Workforce Improvement Act [DAWIA], 1990; GAO, 2019b; GAO 2019c; Kupec, 2013; Pernin et al., 2012; President's Blue Ribbon Commission on Defense Management, 1986; Redshaw, 2011). While there is a consensus that the DOD's acquisition practices are flawed, there is debate as to whether the discrepancies in performance are caused by the DOD's inherently complex acquisition system or the quality of its acquisition personnel. In an article entitled, "Does the Program Manager Matter? New Public Management and Defense Acquisition," the authors claim that until the acquisitions system and processes of the DOD are fixed, the training and education of program managers could be considered inconsequential to the success of defense programs (Eckerd & Snider, 2017). However, based on the recommendation provided by GAO-18-217, which was focused on improving program management, the DOD's program performance would improve if they would "improve practices that do not align extensively with leading practices" (GAO, 2018a, sec. "GAO Highlights"). This recommendation is further supported by the GAO's annual high-risk list, which lists the DOD career fields that pose a great level of risk to the government if not improved upon or appropriately monitored. DOD weapon systems acquisition has consistently been included on this list

since 1990 (GAO, 2019b). According to the most recent list developed in 2019, DOD program management was considered high risk because of the anticipated $1.66 trillion investments into their acquisition and procurement portfolio (GAO, 2019b). After much consideration by Congress and the DOD, there is still no plan in place guaranteed to resolve the continued shortfalls in meeting cost, schedule, and performance goals (GAO, 2019b). These three factors are the critical measures that programs are weighed against, and the DOD has yet to implement a viable solution to address their repeated inadequacies.

While the DOD has struggled to develop solutions meant to resolve their continued issues with meeting their program's planned cost, schedule, and performance standards, they have made many attempts. One such attempt was implemented under President Reagan's administration. A group of acquisition professionals were assembled under the leadership of David Packard to form President Reagan's Blue Ribbon Commission, also commonly referred to as the Packard Commission. This commission provided the president's administration with a series of recommendations that are still being implemented today. Some of the most notable recommendations include the establishment of clear and simple lines of authority to expedite the acquisition process, the promotion of commercial off-the-shelf procurement, and a focus on prototyping that has led to a larger focus on the engineering and manufacturing development phase of the defense acquisition process (President's Blue Ribbon Commission on Defense Management, 1986).

As it pertains to this research study, the Packard Commission's most relevant recommendation was to implement business-related education and training for acquisition personnel. This recommendation led to the passing of the Defense Acquisition Workforce Improvement Act (DAWIA) of 1990, which then led to the establishment of the Defense Acquisition University (DAU). In fiscal year (FY) 2019 alone, the DAU graduated nearly 200,000 students from resident and online courses for the fields of contracting, finance, program management, and so forth (Woolsey, 2019). Since its inception in 1991, the DAU has structured its acquisition curriculum in a way that would best prepare program managers to maneuver the complexities of the defense acquisition system, which consists of the interoperation of the acquisition process, the Joint Capabilities Integration and Development System (JCIDS) process, and the planning, programming, budget, and execution (PPBE) process. In 2016, the Office of the Assistant Secretary of Defense for

Acquisition distributed the most recent functional career field competencies for program managers and broke them down into the following DOD PM categories: Acquisition Management, Business Management, Technical Management, and Executive Leadership (MacStravic, 2016). From the DOD's perspective, these competencies serve as the standards that would enable program managers to effectively "deliver mission-critical capabilities in terms of equipment and services" (MacStravic, 2016, p. 2). Furthermore, this list of competencies serves as the basis for the DAWIA certification standards offered by the DAU.

The Project Management Institute (PMI) is an independent, private organization that has led the way in establishing the standards for project management, program management, and portfolio management across industries on a global scale. They offer a variety of certifications to business professionals, including the Project Management Professional® (PMP) certification, the Program Management Professional® (PgMP) certification, and the Portfolio Management Professional® (PfMP) certification. Since 1999, the American National Standards Institute (ANSI) has approved PMI's *Guide to the Project Management Body of Knowledge*® (*PMBOK Guide*; PMI, 2017a) as the American national standard for project management (Holtzman, 1999). A contributing factor to the *PMBOK Guide* being ANSI-certified is its wide range of applicability across industries. No matter what industry one is in, the knowledge areas discussed in PMI's *PMBOK Guide* and performance domains of *The Standard for Program Management* (*TSPgM*; PMI, 2017c) and *The Standard for Portfolio Management* (*TSPfM*; PMI, 2017b) will apply.

In December 2019, Congress passed the National Defense Authorization Act for Fiscal Year 2020 (NDAA). The section of this act that is relevant to this research project is Section 861, "Defense Acquisition Workforce Certification, Education, and Career Fields" subsection (c), "Professional Certification" and states

> "The Secretary of Defense shall implement a certification program to provide for a professional certification requirement for all members of the acquisition workforce … the certification requirement for any acquisition workforce career field shall be based on standards developed by a third-party accredited program based on nationally or internationally recognized standards. (NDAA, 2019)."

This subsection has mandated a refocusing of how the DOD trains its program managers. Instead of strictly abiding by the program management functional career field competencies established in 2016, the DOD must develop updated training standards that meet realigned certification requirements. Per the NDAA, it is the role of the Office of the Secretary of Defense to produce the realigned certification program based on nationally or internationally recognized standards of an accredited third party (NDAA, 2019). Per the DAWIA (1990), it is the DAU's role to implement and provide the training that meets the requirements of the updated training standards.

B. PURPOSE

The purpose of this research is to understand the extent to which the DOD's program management functional career field competencies currently align with the internationally recognized standards for project, program, and portfolio management published by the PMI. This research will be used to make recommendations to the DOD on how to best transition from its current program management certification requirements based on the DOD's 2016 program management functional career field competencies to certification requirements based on the PMI standards.

C. RESEARCH QUESTIONS

This study answers the following questions:

- To what extent are the DOD's 2016 program management competency elements aligned with PMI's PMBOK Guide, TSPgM, and TSPfM? Which PMI standard is the most aligned?
- To what extent are the basic, intermediate, and advanced DOD program management competency elements aligned with the PMI standards?
- To what extent do the DOD's program management competency elements align with PMI's PMBOK Guide, TSPgM, and TSPfM when categorized by DAWIA level?
- To what extent do the DOD's four program management categories align with PMI's PMBOK Guide, TSPgM, and TSPfM?
- Which PMI knowledge areas and performance domains are most and least aligned with the DOD program management functional career field competency elements?

D. BENEFITS OF STUDY

The results of this study will provide insight and recommendations for the decision-makers within the OSD and the DAU charged with realigning the program management professional certification. This will enable them to make informed decisions on carrying out the modifications to the program management certification requirements as mandated by the NDAA.

E. SCOPE

This research study focuses on the shift in the basis for DOD program management certification requirements. Specifically, this study pertains to the alignment of the DOD's 2016 program management functional career field competencies (MacStravic, 2016) to the PMI's 10 knowledge areas that comprise the *PMBOK Guide* (PMI, 2017a), the program management performance domains of *The Standard for Program Management* (PMI, 2017c), and the portfolio management performance domains of *The Standard for Portfolio Management* (PMI, 2017b). This study provides traceability between the DOD program management competencies and the aforementioned industry standards and elaborates on the extent to which they are aligned. Finally, this study highlights areas of inconsistency and results in recommendations for changes in DOD standards for training and education and potential policy changes.

F. METHODOLOGY

The researcher took the following steps in developing this study:

- Conducted an extensive literature review of academic articles, government reports, books, conference papers from the PMI, the *PMBOK Guide* (PMI, 2017a), the *Standard for Program Management* (PMI, 2017c), the *Standard for Portfolio Management* (PMI, 2017b), the NDAA for FY2020 (NDAA, 2019), and other key sources.
- Organized the knowledge areas and domains from the PMI's standards for project, program, and portfolio management and the DOD's program management functional career field competencies—into a single spreadsheet to perform a comparative analysis between the two entities.
- Performed a qualitative, lexicographic analysis of the descriptions of the DOD's program management competencies and the descriptions of the PMI's knowledge areas and domains. This highlighted key words and

phrases from the description of each knowledge area, domain, and competency and allowed for an informed mapping of the DOD's existing competencies to the PMI's standards.

- Used the findings of the qualitative analysis to perform an extensive quantitative analysis that answered the five research questions.

G. ORGANIZATION OF STUDY

This research study consists of five chapters.

(1) Chapter I: Introduction

This chapter introduces the context for this project through a detailed background of program management. Specifically, it outlines the purpose, research questions, benefits, scope, and methodology of this research study.

(2) Chapter II: Literature Review

Chapter II includes the review of the literature that was conducted to aid in the completion of this study. There are five parts to the literature review that cover previous acquisition reforms, government reports on acquisitions, the PMI, scholarly articles that cover ideas for future reform, auditability theory, and competency models.

(3) Chapter III: Methodology

Chapter III elaborates on the methodology used to collect the data, explains why the data sources were used, and details each category of data studied.

(4) Chapter IV: Data Analysis

This chapter demonstrates and reports the findings of the research and addresses the five research questions:

- To what extent are the DOD's 2016 program management competency elements aligned with PMI's PMBOK Guide, TSPgM, and TSPfM? Which PMI standard is the most aligned?
- To what extent are the basic, intermediate, and advanced DOD program management competency elements aligned with the PMI standards?
- To what extent do the DOD's program management competency elements align with PMI's PMBOK Guide, TSPgM, and TSPfM when categorized by DAWIA level?

- To what extent do the DOD's four program management categories align with PMI's PMBOK Guide, TSPgM, and TSPfM?
- Which PMI knowledge areas and performance domains are most and least aligned with the DOD program management functional career field competency elements?

(5) Chapter V: Conclusion and Recommendations

Chapter V begins with a summary of the research and conclusions. The conclusion provides the answers to the research questions and offers recommendations for changes in DOD training and education standards and areas for future research.

H. INTRODUCTION SUMMARY

The issues surrounding the DOD's program management career field cannot be resolved overnight. However, the career field can increase its ability. As Rendon (2019) discusses in his paper, "Enhancing Professional and Technical Excellence: Analysis of Contract Management Competency Models," it is important to make an organization auditable so that it will be better suited to achieve its mission goals and objectives. The concept of auditability consists of three main components: capable processes, effective internal controls, and competent personnel. The DOD already has robust processes for the program management career field in the form of JCIDS, the PPBE system, and the acquisition process. They also have effective internal controls provided by the GAO, DOD's Office of Inspector General (DOD IG), Congress, and laws such as the Nunn—McCurdy Act (Schwartz, 2010)—which is supposed to encourage cost control. The ultimate goal of this research is to aid the DOD in improving upon the third component of auditability: competent personnel.

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II. LITERATURE REVIEW

As previously discussed, defense acquisitions have been continually criticized for failing to meet cost, schedule, and performance objectives. According to the theory of auditability, there are three components that must be achieved to ensure that organizations, or project managers in this case, are meeting their objectives. They are competent personnel, capable processes, and effective internal controls (Rendon & Rendon, 2015). In response to the deficiencies in these three areas, the DOD has implemented multiple acquisition reform initiatives to improve its acquisition processes. The reform initiatives have also modified the acquisition reporting structure and used the power of government watchdogs such as the GAO and the DOD IG to implement effective internal controls. To improve the quality of its acquisition professionals, the DOD has made frequent modifications to the training and education requirements. This literature review covers former acquisition reform initiatives, internal and external findings on DOD acquisition performance, the standards published by the PMI, and scholarly articles that express support and opposition to modifying the alignment of the DOD competencies to the standards of a third party.

A. ACQUISITION REFORM THROUGH THE YEARS

In 1985, the Reagan administration appointed former U.S. Secretary of Defense David Packard as the head of its Blue Ribbon Commission, which was established to make recommendations on how to improve defense acquisitions. The output of the Packard Commission resulted in nine recommendations; the one addressed in this research study is the recommendation to enhance the quality of acquisition personnel (President's Blue Ribbon Commission on Defense Management, 1986). This recommendation focused on improving the appointment criteria of senior-level personnel to more effectively run programs and portfolios and called for business-related education for civilians and for federal law to allow acquisition personnel to pursue expanded opportunities for education and training (President's Blue Ribbon Commission on Defense Management, 1986). This recommendation was finally implemented via the passing of the DAWIA in 1990. The DAWIA (1990) resulted in the development of the DAU and the establishment of baseline

education and training requirements for acquisition professionals. The DAWIA (1990) also outlined elevated requirements for personnel assigned to critical positions such as program executive officers and senior contracting officials.

The DAU is the primary source of training for defense acquisition professionals. The DAU provides formal courses as well as continuous learning modules to promote continuing education and professional growth for thousands of students every year (Woolsey, 2019). To date, these courses are structured to accommodate DAWIA certification requirements and have been broken down into three categories:

- **Level I:** basic or entry level
- **Level II:** intermediate or journeyman level
- **Level III:** advanced or senior level. Additional training standards are required for unique positions, including program executive officers and program managers of major defense acquisition programs or major automated information systems (DOD & DAU, n.d.).

The content of the training requirements for program managers is based on the DOD program management functional career field competencies that are periodically updated. The latest update was approved and published by the Office of the Assistant Secretary of Defense in 2016 and breaks the competencies down into four overarching PM categories and subsequent competencies:

- **Acquisition Management:** capability integration planning, acquisition law and policy, international acquisition and exportability, stakeholder management, program execution, and services acquisition
- **Business Management:** contract management and financial management
- **Technical Management:** engineering management, defense business systems, test and evaluation management, and product support management
- **Executive Leadership (Level III education for unique positions):** foundational competencies, leading change, leading people, results driven, and building coalitions (MacStravic, 2016).

These DOD PM categories have served as the basis for developing the learning objectives and training materials for program managers (MacStravic, 2016).

In November 2019, the NDAA directed the Secretary of Defense to implement a certification program based on standards developed by a third-party (NDAA, 2019). For

the DOD's program management curriculum, this requires adjusting the training standards from being based on the 2016 functional career field competencies to instead being founded on the "standards developed by a third-party accredited program based on nationally or internationally recognized standards" (NDAA, 2019, p. 778). This shift from DOD-centric competencies to the widely accepted standards of the private sector is an attempt to improve the quality of defense acquisition personnel by making them more capable to work with industry partners throughout the acquisition process. Furthermore, the purpose of this reform initiative is to change the mindset of program managers as well as the quality of their performance through better training.

B. REPORTS ON DOD ACQUISITIONS

As previously discussed, the defense acquisition career field has been on the GAO's high-risk list since 1990 because of the career field's failure in meeting the five criteria for removal: leadership commitment, capacity, action plan, monitoring, and demonstrated progress (GAO, 2019c). Of those five, the career field meets the criteria for leadership commitment, but only partially meets the other four. This continued pattern of insufficiency makes the DOD vulnerable to budget and schedule overruns and underperformance, both of which have been seen in major programs like the F-35 Joint Strike Fighter (GAO, 2018b) and the Army Future Combat Systems (Pernin et al., 2012). It is because of poor returns on investment exhibited by these and other programs that have led to the acquisition career field being placed on the high-risk list (GAO, 2019c) and created demand for reform (Gansler, 2007).

While there is little to no debate from lawmakers and acquisition leaders that there is certainly room for improvement in how the DOD manages its programs, there are different thoughts on how the DOD should work to improve the acquisition career field. There are multiple GAO reports that have contradicting views on what specifically needs to change to get defense acquisition on track and off of the high-risk list. Some reports recognize that the certification training offered by the DAU is capable of providing adequate training to program managers (GAO 2010), whereas others state that the issues with the military services' program management emanate from those very same training standards not aligning with leading practices (GAO, 2018a). The takeaway from these two

findings is that the DAU has the infrastructure and organizational alignment to provide effective training, but the training it is currently providing is ineffective because it does not align with more widely accepted standards. This issue could be addressed by incorporating the advisement that the GAO provided to the Office of Management and Budget (OMB), whose program management standards were lacking sufficient detail. The advice was to heed the recommendations of the Program Management Improvement Accountability Act (PMIAA, 2016) and "adopt an existing set of consensus-based standards, such as the widely accepted standards for program and project management from the Project Management Institute" (GAO, 2019b, p. 11).

C. THE PROJECT MANAGEMENT INSTITUTE

The PMI is a not-for-profit association that publishes consensus standards for certification programs, which include the PMP, the PgMP, and the PfMP. Each of these credentials serves as an indicator that the individual is qualified to lead a project, manage a program, and meet strategic objectives in overseeing one or more portfolios, respectively (PMI, 2020). The PMI certifications are recognized on a global scale because of their highly detailed and superior standards. Below are the descriptions of each of the three aforementioned credentials as well as their respective frameworks.

In 1999, the ANSI declared that the foundation to PMI's PMP certification, the *PMBOK Guide* (PMI, 2017a), was the American national standard for project management (Holtzman, 1999). In order to earn the PMP--credential from the PMI, candidates must apply by demonstrating that they have a high school diploma or associate's degree, 5 years of experience in leading projects, and 35 hours of project management education/training. If a candidate has a 4-year degree, then they only need to have 3 years of experience in leading projects (PMI, 2020). This credential is ideal for individuals who lead cross-functional project teams and manage projects, which the PMI defines as "temporary endeavors undertaken to create a unique product, service or result" (PMI, 2017a, p. 4).

The PMP credential is broken down into three primary components: 10 knowledge areas, 5 process groups, and 49 processes. Project management knowledge areas are categorized by their knowledge requirements and are described in terms of their various component processes, practices, inputs, outputs, tools, and techniques (PMI, 2017a). The

5 process groups are the "logical grouping of project management inputs, tools and techniques, and outputs, and include initiating, planning, executing, monitoring and controlling, and closing" (PMI, 2017a, p. 18). Project management processes are defined as "systematic activities directed toward causing an end result where one or more inputs will be acted upon to create one or more outputs" (PMI, 2017a, p. 18). The PMI organizes their processes under the meeting of knowledge areas and process groups. For example, under the "Executing" process group and the "Quality Management" knowledge area, there is the "Manage Quality" process (PMI, 2017a, p. 25). Figure 1 includes a complete list of the 49 processes that fall under the different knowledge areas and process groups in the *PMBOK Guide* (PMI, 2017a).

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work 4.4 Manage Project Knowledge	4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control	4.7 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Schedule Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule		6.6 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Manage Quality	8.3 Control Quality	
9. Project Resource Management		9.1 Plan Resource Management 9.2 Estimate Activity Resources	9.3 Acquire Resources 9.4 Develop Team 9.5 Manage Team	9.6 Control Resources	
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Monitor Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses	11.6 Implement Risk Responses	11.7 Monitor Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Engagement	13.3 Manage Stakeholder Engagement	13.4 Monitor Stakeholder Engagement	

Figure 1. Ten Knowledge Areas of the *PMBOK Guide.* Source: PMI (2017a).

The PgMP certification is based on *The Standard for Program Management* (*TSPgM;* PMI, 2017c). The purpose of *TSPgM* is to provide generally recognized guidance on principles, practices, and actions to support good program management practices. Furthermore, this standard is meant to provide a common understanding of the role of a program manager and offer guidance in their interactions with portfolio and project managers as well as any other program stakeholders (PMI, 2017c). According to the PMI, a program is made up of "related projects, subsidiary programs, and program activities managed in a coordinated manner" (PMI, 2017c, p. 3). When programs are run effectively, they can deliver benefits that would not have been attainable had their subsidiary programs and projects been managed independently of one another.

Similar to the 10 knowledge areas in the *PMBOK Guide* (PMI, 2017a), *TSPgM* discusses five performance domains that are "complementary groupings of related areas of activity or function that uniquely characterize and differentiate the activities found in one performance domain from the others within the full scope of program management work" (PMI, 2017c, p. 23). The purpose of these domains is to provide program managers with a general checklist of tasks, analyses, and concepts to complete and consider throughout the life of the program. Figure 2 illustrates these domains.

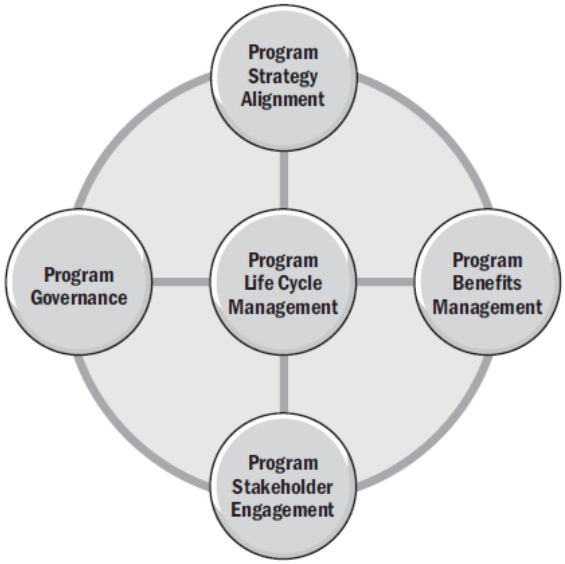

Figure 2. Program Management Professional Performance Domains. Source: PMI (2017c).

The PfMP certification is based on *The Standard for Portfolio Management* (*TSPfM*; PMI, 2017b), the purpose of which is to provide portfolio management principles and performance management domains that are considered to be good practices for organizations that manage complex programs and projects. Furthermore, this standard is meant to provide a common understanding of the role of a portfolio manager as well as a unified vocabulary to use across industries (PMI, 2017b). According to the PMI, "a portfolio is a collection of projects, programs and subsidiary portfolios and operations managed as a group to achieve strategic objectives" (PMI, 2017b, p. 3). The purpose of managing a portfolio versus independent programs and projects is to achieve organizational objectives and strategies that could not be met otherwise.

TSPfM is very similar to *TSPgM* in that it consists of seven performance domains and is supported by the *PMBOK Guide*. These seven performance domains, when followed and executed correctly, are what allow for the portfolio management plan to achieve its desired impact on strategy and performance (PMI, 2017b). For a complete list of these domains and what items are associated with them, see Figure 3.

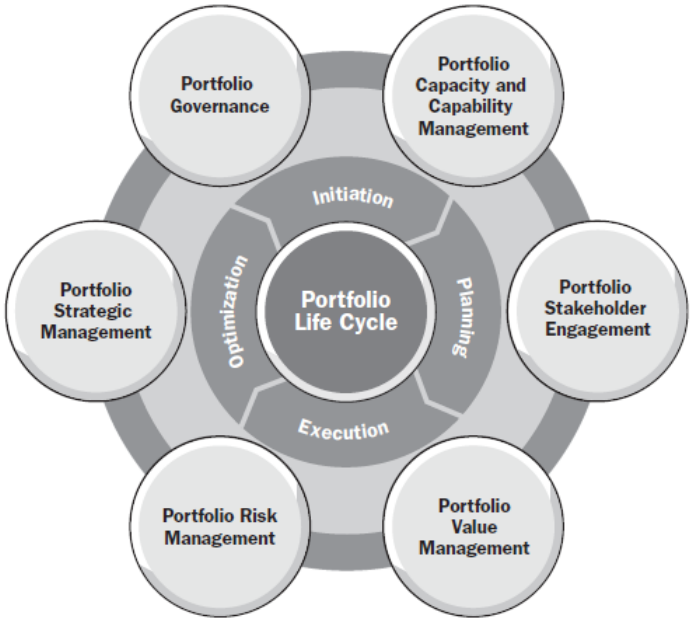

Figure 3. Portfolio Management Professional Performance Domains. Source: PMI (2017b).

In the early 2000s, the DOD worked with the PMI to develop the *U.S. Department of Defense Extension to: A Guide to the Project Management Body of Knowledge (PMBOK*

Guide) (DOD & DAU, 2003). The purpose of the DOD and PMI collaboration was to identify defense applications of the *PMBOK Guide*'s knowledge areas and to meet the published objective of the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD[AT&L]) to build credibility in acquisitions and logistics support by improving cost estimation techniques and implementing evolutionary acquisition to deliver systems at a lower cost and on schedule (DOD & DAU, 2003). Despite the DAU's investment of time and money into the creation of the *PMBOK Guide*'s extension, the first edition would be the only edition to be published and was never implemented into the certification curriculum of the DAU due to budget cuts in 2006 (Kupec, 2013).

D. SUPPORT FOR DOD BASING EDUCATION AND TRAINING ON PMI STANDARDS

It has been well established that programs in the DOD have struggled to effectively manage program cost, schedule, and performance for decades (GAO, 2019b; GAO 2018a; GAO 2018b). The NDAA (2019) addresses this issue by mandating that the DAU modify its existing certification requirements to be based on the standards of an accredited third party with nationally recognized standards. Because of the high visibility and volatility of defense acquisitions, there have been many scholarly studies on how the DOD could improve their training standards by mirroring an entity like the PMI (Choi, 2009; Kupec, 2013; Redshaw, 2011). In comparison to the progressive complexity of PMI's certifications for project, program, and portfolio management, the DAWIA certifications for Level I (beginning), Level II (intermediate), and Level III (advanced) "correlate to the complexity and responsibilities required for designated positions and different types of assignments in weapon systems, services, business management systems and information technology, and international acquisitions" (Redshaw, 2011, p. 55). Both Kupec (2013) and Choi (2009) concur with this analysis and elaborate further that modeling the new DAU standards after only one of the PMI credentialing standards—PMP for example—would not be sufficient. As mentioned above, the individuals who earn the PMP credential have proven themselves to be capable of effectively leading cross-functional project teams and managing a temporary project. While this credential is great to earn and holds a lot of value in the program management industry, the body of knowledge that accompanies it would not be

enough to equip an individual to run a complex decade-long program or portfolio. For these reasons, it is vital to base the new DAWIA certification requirements on all three of the PMI credentials.

E. OPPOSITION TO DOD BASING EDUCATION AND TRAINING ON PMI STANDARDS

According to auditability theory, in order for an organization, project team, program office, or portfolio executive officer to meet their specific objectives, it is critical that competent personnel are employed, effective internal controls are maintained, and capable processes are implemented (Rendon & Rendon, 2015). As it relates to defense acquisition reform, there are divergent opinions as to which of the three components of auditability should be focused on to improve program metrics in cost, schedule, and performance. For example, Eckerd and Snider (2017) claim that the defense acquisition processes should be the focal point for reform due to their complexities. They add that the environmental politics that program managers maneuver on a daily basis prevent them from being effective, which nullifies any quality training they undergo. Other research comes to a similar conclusion that in order to make significant changes in federal acquisitions, all acquisition reform needs to target the PPBE system, JCIDS system, and the defense acquisition process (Bond et al., 2016).

F. SUMMARY

The literature reviewed to support this study includes studies on auditability theory and former acquisition reform initiatives that have modified the training requirements of DOD program managers such as the NDAA for FY2020, the DAWIA, and the Packard Commission. Other literature that was reviewed included GAO reports, frameworks from the PMI's different credentials, and scholarly articles that express support for and opposition to the realignment of the DOD competencies with the standards of the PMI. The findings from this literature provided that there is room for improvement in how DAU carries out its training. Furthermore, the realignment of the DOD's program management certification standards should be based on the PMI's *PMBOK Guide, TSPgM*, and *TSPfM* while maintaining the same three-tiered level of experience and certification as they have now. Finally, the findings emphasize the importance of not ignoring the other two

components of auditability—governance and effective processes—when focusing on how to improve the training of acquisition personnel.

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III. METHODOLOGY

This chapter elaborates on the methodology used in developing and conducting the analysis of alignment between the DOD's project management competencies and the standards of PMI's project, program, and portfolio management knowledge areas and performance domains. The chapter explains the sources used to collect the data, why those sources were selected, the methodology used in analyzing the data, the tools used in organizing and storing the data, the data organization, and the rationale for this methodology.

A. SOURCES OF DATA

In conducting this research, it was paramount to select the most up-to-date and relevant sources. By utilizing the most current sources of information, the usefulness and relevancy of this study are prolonged. The data sources used in this study were collected from the Office of the Assistant Secretary of Defense for Acquisition (OASD[A]) and PMI.

1. Office of the Assistant Secretary of Defense for Acquisition

In 2016, the acting principal deputy assistant secretary of defense for acquisition drafted and released a memorandum entitled "Program Management Functional Career Field Competencies" (MacStravic, 2016). This memorandum was the primary DOD source used in analyzing the alignment between the DOD's program management PM competencies and PMI's standards. The memorandum informed the secretaries of the military departments and the directors of the defense agencies that the PM functional career field competencies published in 2008 were to be replaced with updated PM competencies (MacStravic, 2016). According to the memorandum, an integrated product team was charged with developing the updated competencies while considering the three certification levels offered by the DAU: basic (Level I), intermediate (Level II), and advanced (Level III; MacStravic, 2016; OUSD[AT&L], 2005). The memorandum includes the following information:

1. **Program Management Competency Units and Competencies:** This document lists the 2016 PM competencies organized into the four program

management categories and 18 units of competency. Figure 4 demonstrates the distribution of the competencies and Table 1 provides a quantitative breakdown of its contents.

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	

Figure 4. DOD Program Management Competency Units and Competencies. Source: MacStravic (2016).

Table 1. Breakdown of DOD Program Management Competency Units and Competencies. Adapted from MacStravic (2016).

	Acquisition Management	Business Management	Technical Management	Executive Leadership	Total
Units of Competency	6	2	5	5	18
Competencies	23	10	16	21	70
Elements	58	36	54	42	190

2. **Program Management Functional Career Field Competencies**: Figure 5 is an excerpt from a table in MacStravic (2016) that provides descriptions of the 70 competencies for each of the three DAU certification levels. The table organizes its data under the following column headings: unit #, unit of competency, unit of competency description, competency #, competency name, element #, basic competency element description, intermediate competency element, and advanced competency element description. Figure 5 and Figure 6 provide excerpts from this document to visualize the organization.

Unit #	Unit of Competency	Unit of Competency Description	Comp #	Competency Name	Element #
AM1	**Capability Integration Planning**	**Ability to develop both a short and long range, innovative acquisition plan/ strategy that provides industry with the frame work for creating functional activities essential to the development of a technology or system/product and manufacturing and fielding.**	1.1	Requirements management	1.1.1
AM1	Capability Integration Planning	Ability to develop both a short and long range, innovative acquisition plan/ strategy that provides industry with the frame work for creating functional activities essential to the development of a technology or system/product and manufacturing and fielding.	1.1	Requirements management	1.1.2

Figure 5. DOD's PM Functional Career Field Competencies Table. Source: MacStravic (2016).

Basic Competency Element Description	Intermediate Competency Element Description	Advanced Competency Element Description
Understand that program and portfolio requirements are derived from capability needs statement and CONOPs per the Joint Capabilities Integration and Development System (JCIDS) outputs or functional problem statements (for business systems) to establish the Acquisition Program Baseline (APB).	Derive or assist in deriving 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).	Derive, or supervise the 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).
Understand that there is a process in place that allows the management of the program's requirements baseline, to include interfaces across the program life cycle.	In coordination with the user, utilize a process to create and manage the program requirements baseline, to include interfaces across the program life cycle.	Implement a process, in coordination with the user, to create and manage program requirements baseline (including interfaces) across the program life cycle

Figure 6. DOD's PM Functional Career Field Competencies Table Continued. Source: MacStravic (2016).

2. Project Management Institute

The data sources used from the PMI include the 6th edition of the *PMBOK Guide*, the 4th edition of *TSPgM,* and the 4th edition of *TSPfM*. Although the *PMBOK Guide* is the only ANSI-accredited standard of the three sources, the contents of *TSPgM* and *TSPfM* are generally recognized as good practices for program and portfolio managers, respectively. The two standards (*TSPgM* and *TSPfM*) define good practices as a general consensus that the application of their principles and practices enhances the likelihood of program and portfolio success (PMI, 2017b; PMI, 2017c).

a. A Guide to the Project Management Body of Knowledge (PMBOK Guide), 6th edition

The *PMBOK Guide* was developed to simplify and consolidate the vast body of knowledge that makes up the project management profession. It is an evolving standard due to the improving and ever-changing nature of the project management field. At the time of this research, the 6th edition of the *PMBOK Guide* was the most up-to-date standard. Although the development of the 6th edition was "developed by project managers for project managers … research-informed and evidence-based" (PMI, 2017d) ANSI still requires PMI to review it every 5 years to ensure it is representative of current project management practices. PMI's review and update process is a comprehensive endeavor that relies on the experience and opinions of project management professionals throughout the world (PMI, 2017d). The first stage in the process involves recruiting a volunteer core committee of 10 project managers from various countries. The committee uses its and over 100 content contributors' expertise to review and revise the incumbent *PMBOK Guide* (PMI, 2017d). The core committee then writes and releases a revised draft to every PMI member and requests feedback (PMI, 2017d). The core committee of the 6th edition received over 8,500 comments critiquing the draft, all of which were formally reviewed and replied to; every commenter was then allowed to submit an appeal to the committee's verdict (PMI, 2017d). The second stage in PMI's review and update process involves forming an advisory group of PMI members that serves as a consensus body that ensures the draft makes sense as a whole and aligns with PMI's practices, values, and standards (PMI, 2017d).

The *PMBOK Guide* consists of 10 knowledge areas comprised of 49 processes that fall into five different process groups. Figure 1 provides a map of these different elements with the knowledge areas on the vertical axis, process groups on the horizontal axis, and the processes listed throughout. The 10 knowledge areas include project integration management, scope management, schedule management, cost management, quality management, resource management, communications management, risk management, procurement management, and stakeholder management (PMI, 2017a). The 10 knowledge areas, processes, and the three elements that are applicable across all knowledge areas were used as a source of comparison to the DOD's PM competencies in this research.

As an ANSI-approved standard, the *PMBOK Guide* (PMI, 2017a) meets the criteria of the NDAA (2019), as it is an accredited third-party program based on nationally recognized standards. It is for these reasons that the researcher selected the *PMBOK Guide* as a source of comparison to the DOD's PM competencies.

b. The Standard for Program Management (TSPgM) 4th edition

TSPgM was first developed in 2005 (Ross, 2006) to provide "guidance on principles, practices, and activities of program management … [and to] provide a common understanding of the role of a program manager" (PMI, 2017c, p. 2). This standard both complements and aligns with PMI's *PMBOK Guide* (PMI, 2017a) and *TSPfM* (PMI, 2017b). While the content is similar to that of the *PMBOK Guide, TSPgM* is broader in scope and consists of only five program management performance domains: program strategy alignment, program benefits management, program stakeholder engagement, program governance, and program life cycle management. These performance domains, and various elements applicable across all program management domains, serve as this paper's source of comparison to the DOD's PM competencies. It is crucial to include *TSPgM* in this research study because DOD's program managers do not only manage projects. Their scope of responsibility ranges from participating on a project team to running large programs and portfolios. It is for these reasons that *TSPgM* was selected as a source of comparison to the DOD's PM competencies.

c. The Standard for Portfolio Management (TSPfM), 4th edition

TSPfM (PMI, 2017b) was first developed in 2005 to establish guiding principles for portfolio management practices and activities and for defining the role of the portfolio manager (Ross, 2005). It was written to align with PMI's *PMBOK Guide* and *TSPgM*. Like *TSPgM*'s relationship to the *PMBOK Guide, TSPfM* is broader in scope than other standards. The scope differences are necessary because portfolios require a higher level of oversight than either programs or projects. Portfolios are ongoing ventures and may consist of other portfolios, programs, and projects. On the other hand, programs are made up of only other programs and projects; and projects, smaller still, are temporary and independent endeavors (PMI, 2017a, 2017b, 2017c). Seven portfolio management performance domains make up *TSPfM*: the portfolio life cycle, portfolio strategic management, portfolio governance, portfolio communications management, portfolio value management, and portfolio risk management. These performance domains and the elements applicable across all portfolio management domains, serve as this paper's source of comparison to the DOD's PM competencies. As previously discussed, it is crucial to include *TSPfM* in this research study because of the broad scope of responsibility assigned to DOD PMs. It is for these reasons that *TSPfM* was selected as a source of comparison to the DOD's PM competencies.

B. QUALITATIVE ANALYSIS OF QUALITATIVE DATA

As discussed, the purpose of this research is to discover the degree to which the DOD's 2016 PM competencies align with the standards of PMI's *PMBOK Guide, TSPgM,* and *TSPfM.* Analyzing and defining the level of alignment between the two organizations' standards enables education and training organizations like the DAU to become cognizant of which DOD PM competencies are aligned and unaligned with PMI's standards. Per the NDAA (2019), it is the DOD's responsibility to decide which existing PM competencies prove to be unaligned with PMI standards to delete, modify to be in alignment with PMI standards, or keep the same because of their value-added to DOD-specific program management requirements. In order to uncover the level of alignment for each competency, it was essential to build a competency map based on qualitative analysis.

The structure of the competency map constructed by the researcher closely mirrors the organization of the OASD(A)'s program management functional career field competencies. The map was constructed in this manner for both ease of organization and for continuity. The headings of the OASD(A)'s table of competencies are shown in Figure 5 and are explained in the following list:

- **Unit #:** This is the coding of the four DOD PM categories (i.e., Acquisition Management [AM], Business Management [BM], Technical Management [TM], and Executive Leadership [EL]) and their successive units of competency. For example, the unit # for Capability Integration Planning is AM1 because it is the first unit of competency that falls under the Acquisition Management (AM) management category.
- **Unit of Competency:** This heading consists of the competency units that make up the four DOD PM categories, and is made up of multiple competencies.
- **Competency #:** This is the coding of each DOD PM competency. For example, the Capability Integration Planning competency is broken down into three different competencies: 1.1 - Requirements Management, 1.2 – Acquisition Program Strategic Planning, 1.3 – Business Case Development.
- **Competency Name:** This heading consists of the names for all 70 DOD PM competencies (i.e., Requirements Management, Acquisition Program Strategic Planning, Business Case Development, etc.).
- **Element #:** DOD PM competency elements are the lowest level that the DOD PM competencies are broken down to. Each element has a different description at the basic, intermediate, and advanced level. The PMI standards were mapped to each of the 190 elements at the basic, intermediate and advanced level (570 total element descriptions) to paint a clear picture of the overall alignment. The "Element #s" are the coding of each element. For example, Element 1.1.1 = descriptor of the Requirements Management competency, which falls under the Acquisitions Management (AM1) PM category and the Capability Integration Planning unit of competency.
- **Basic Competency Element Description:** This heading contains the descriptions for the basic (DAWIA Level I) elements.
- **Intermediate Competency Element Description:** This heading contains the descriptions for the intermediate (DAWIA Level II) elements.
- **Advanced Competency Element Description:** This heading contains the descriptions for the advanced (DAWIA Level III) elements.

The researcher added six columns to the OUSD(A)'s table of competencies in order to aid in the mapping process. These six columns and their placement are elaborated below

and can be seen in Figure 7, Figure 8, and Figure 9 to visualize the basic, intermediate and advanced element mappings, respectively.

- **Basic *PMBOK Guide* Equivalent:** This column was used to list the *PMBOK Guide*'s knowledge area processes that aligned with corresponding DOD PM basic competency elements.
- **Intermediate *PMBOK Guide* Equivalent:** This column was used to list the *PMBOK Guide*'s knowledge area processes that aligned with corresponding DOD PM intermediate competency elements.
- **Intermediate *TSPgM* Equivalent:** This column was used to list *TSPgM* performance domain elements that aligned with corresponding DOD PM intermediate competency elements.
- **Advanced *PMBOK Guide* Equivalent:** This column was used to list the *PMBOK Guide*'s knowledge area process that aligned with corresponding DOD PM advanced competency elements.
- **Advanced *TSPgM* Equivalent:** This column was used to list *TSPgM* performance management domain elements that aligned with corresponding DOD PM advanced competency elements.
- **Advanced *TSPfM* Equivalent:** This column was used to list *TSPfM* performance management domain elements that aligned with corresponding DOD PM advanced competency elements.

Name	#	Basic Competency Element Description	Basic *PMBOK Guide* Equivalen
Requirements management	1.1.4	Identify a rapid response situation and be aware of the unique documents and procedures needed to support urgent warfighter needs.	2.3 Organizational Process Assets 11.2 Identify Risks 11.6 Implement Risk Responses
Requirements management	1.1.5	Understand how a system of systems architecture influences the decision making process for requirements while meeting "customer needs".	
Requirements management	1.1.6	Be aware of the best practices used in trade-off analysis and system engineering that influence requirements related program	2.4 Organizational Systems 5.2 Collect Requirements
Requirements management	1.1.7	Be aware of the DoD Information Enterprise Architecture and the requirements for adherence to it.	2.2 Enterprise Environmental Factors 2.3 Organizational Process Assets 2.4 Organizational Systems
Acquisition Program Strategic Planning	1.2.1	Be aware of the requirement for an organizational mission, vision of success, and fundamental values at they relate to achieving successful acquisition outcomes	2.2 Enterprise Environmental Factors 4.1 Develop Project Charter

Figure 7. Competency Mapping Table Excerpt with Added Headings for Basic Competency Elements. Adapted from MacStravic (2016).

Competency Name	Element #	Intermediate Competency Element Description	Intermediate *PMBOK Guide* Equivalent	Intermediate *TSPgM* Equivalent
Requirements management	1.1.4	Identify and articulate rapid response situations and utilize the unique documents and procedures needed to support urgent warfighter needs.	2.3 Organizational Process Assets 4.6 Perform Integrated Change Control 10.2 Manage Communications 11.2 Identify Risks	6.1 Program Governance Practices 7.2 Program Activities and Integration Management 8.2 Program Delivery Phase Activities
Requirements management	1.1.5	Utilize the requirements process with the user to make decisions in support of a system of systems architecture while meeting "customer needs".		
Requirements management	1.1.6	Identify and utilize best practices when conducting trade-off analysis and system engineering when making requirements related	2.4 Organizational Systems 5.2 Collect Requirements	
Requirements management	1.1.7	Utilize the DoD Information Enterprise Architecture.	2.2 Enterprise Environmental Factors 2.3 Organizational Process Assets 2.4 Organizational Systems	8.1 Program Definition Phase Activities
Acquisition Program Strategic Planning	1.2.1	Utilize the organization's mission, vision of success, and fundamental values at they relate to achieving successful acquisition outcomes as guiding tools for decisions within program	2.2 Enterprise Environmental Factors	3.1 Program Business Case 3.2 Program Charter 6.1 Program Governance Practices

Figure 8. Competency Mapping Table Excerpt with Added Headings for Intermediate Competency Elements. Adapted from MacStravic (2016).

Element #	Advanced Competency Element Description	Advanced *PMBOK Guide Equivalent*	Advanced *TSPgM* Equivalent	Advanced *TSPgM* Equivalent
1.1.4	Supervise the identification and articulation of rapid response situations, and ensure the use of the unique documents and procedures needed to support urgent warfighter needs.	2.3 Organizational Process Assets 4.6 Perform Integrated Change Control 10.2 Manage Communications 11.2 Identify Risks	6.1 Program Governance Practices 7.2 Program Activities and Integration Management 8.2 Program Delivery Phase Activities	2.3 Ongoing Life Cycle 2.4 Portfolio Management Information System 3.3 Portfolio Strategic Objectives 3.7 Portfolio Roadmap
1.1.5	Guide the requirements process together with the user to meet "customer needs" and support decisions in the context of system of systems architecture	5.2 Collect Requirements 12.3 Manage Stakeholder Engagement	5. Program Stakeholder Engagement 5.1 Program Stakeholder Identification 5.4 Program Stakeholder Engagement	6. Portfolio Stakeholder Engagement
1.1.6	Identify and incorporate best practices in trade-off analysis and system engineering to make requirements related program decisions	2.4 Organizational Systems 5.2 Collect Requirements	6.1 Program Governance Practices 6.3 Program Governance Design and Implementation	5.4 Capacity Planning 7.5 Negotiating Expected Value
1.1.7	Ensure the DOD Information Enterprise Architecture is implemented.	2.2 Enterprise Environmental Factors 2.3 Organizational Process Assets 2.4 Organizational Systems	8.1 Program Definition Phase Activities	2.4 Portfolio Management Information System
1.2.1	Develop and document the organization's mission, vision of success, and fundamental values as they relate to achieving successful acquisition outcomes	2.2 Enterprise Environmental Factors 4.1 Develop Project Charter	3.1 Program Business Case 3.2 Program Charter 6.1 Program Governance Practices	1.7 Principles of Portfolio Management 1.11 Other Roles in Portfolio Management 3.4 Developing Portfolio Strategic Objectives 3.6 Portfolio Charter

Figure 9. Competency Mapping Table Excerpt with Added Headings for Advanced Competency Elements. Adapted from MacStravic (2016).

The beginning of this research required the qualitative analysis of qualitative data—the qualitative data being the subject matter of the DOD's PM competency descriptions and the contents of PMI's knowledge areas and performance management domains, and the qualitative analysis being the mapping of the two organizations' standards. This analysis was conducted with subjectivity, as interpretive studies of the lexicon are apt to be (Bernard, 1996). In total, the researcher performed six qualitative analyses of lexicographic comparisons for this study:

1. DOD's basic (DAWIA Level I) PM competencies to PMI's *PMBOK Guide* knowledge areas and processes
2. DOD's intermediate (DAWIA Level II) PM competencies to PMI's *PMBOK Guide* knowledge areas and processes
3. DOD's intermediate (DAWIA Level II) PM competencies to PMI's *TSPgM* program management domains
4. DOD's advanced (DAWIA Level III) PM competencies to PMI's *PMBOK Guide* knowledge areas and processes
5. DOD's advanced (DAWIA Level III) PM competencies to PMI's *TSPgM* program management domains
6. DOD's advanced (DAWIA Level III) PM competencies to PMI's *TSPfM* portfolio management domains

The purpose of performing these six iterations of comparison was to account for the increasing level of scope for both PMI's program and portfolio management and the DAWIA Level II and III certification requirements. Furthermore, because the *PMBOK Guide* serves as the foundation for *TSPgM and TSPfM*, it too should be the foundation for the three levels of DAWIA certification.

While this qualitative analysis involved subjective influences, the researcher performed a continuous and thorough review of the DOD and PMI subject matter. The sources used in the knowledge review for the DOD's PM competencies included the DOD 5000 series (OUSD[A&S], 2020), the competency descriptions provided by the OASD(A) (2016), and acqnotes.com. While the acqnotes.com website is not an official affiliate of the DOD or any of its agencies, it is a valuable resource for defense acquisition terms, concepts, and processes. The above resources were used to fill gaps in knowledge throughout this qualitative analysis, for terms, processes, and concepts that were unfamiliar or uncertain. Similarly, in searching for DOD PM competency equivalents in PMI's *PMBOK Guide*,

TSPgM, and *TSPfM*, PMI sources were used to fill knowledge gaps for unfamiliar PMI concepts. PMI conference papers served as the primary source for additional information on PMI standards (Alie, 2016; Ross & Shaltry, 2006; Shenhar & Dvir, 2004). Fewer additional sources were required to fill the researcher's knowledge gap of PMI standards and processes than were used to fill the gap in knowledge of DOD competencies because PMI's *PMBOK Guide*, *TSPgM*, and *TSPfM* are meant to inform and educate. In contrast, the DOD's competency descriptions describe the standards on which DOD PMs must be educated. The analytical detriments of subjectivity were mitigated by the researcher's attempt to inform the analysis through continuous research of objective definitions and explanations of standards and concepts.

The qualitative analysis process was performed in the order of DOD PM competency units. For example, in mapping the DOD PM competencies to the *PMBOK Guide* knowledge areas, the researcher began with the elements within the Acquisition Management unit, followed by Business Management unit elements, Technical Management unit elements, and Executive Leadership unit elements. The researcher also used a bottom-up approach by mapping—in order—the basic, intermediate, and advanced levels of each element before moving to the next. For example, in consideration of the excerpts from Figure 5 and Figure 6 on page 24, the process went as follows:

1. Ensure an understanding of the Acquisitions Management unit (AM1) and the Capability Integration Planning unit of competency's Requirements Management competency—Element 1.1.1.
2. Map Element 1.1.1's basic competency description to the *PMBOK Guide* knowledge areas by annotating the specific process ("5.1 Plan Scope Management," "5.2 Collect Requirements," etc.) and classify the mapping as aligned, somewhat aligned, completely unaligned, or not applicable.
3. Map Element 1.1.1's intermediate competency description to the *PMBOK Guide* knowledge areas by annotating the specific processes ("5.2 Collect Requirements," "5.3 Define Scope," etc.) and classify the mapping as aligned, somewhat aligned, completely unaligned, or not applicable.
4. Map Element 1.1.1's advanced competency description to the *PMBOK Guide* knowledge areas by annotating the specific processes ("5.2 Collect Requirements," "5.3 Define Scope," etc.) and classify the mapping as aligned, somewhat aligned, completely unaligned, or not applicable.
5. Repeat this mapping process for all 190 elements.

6. Repeat Step 1.
7. Map Element 1.1.1's intermediate competency description to the *TSPgM* program management performance domains by annotating the specific domain sections ("3.1 Program Business Case," "3.2 Program Charter," etc.) and classify the mapping as aligned, somewhat aligned, completely unaligned, or not applicable.
8. Map Element 1.1.1's advanced competency description to the *TSPgM* program management performance domains by annotating the specific domain sections ("3.2 Program Charter," "4.1 Benefits Analysis and Planning," etc.) and classify the mapping as aligned, somewhat aligned, completely unaligned, or not applicable.
9. Repeat this mapping process for all 190 elements.
10. Repeat Step 1.
11. Map Element 1.1.1's advanced competency description to the *TSPfM* portfolio management performance domains by annotating the specific domain sections ("2.3 Ongoing Life Cycle," "3.6 Portfolio Charter," etc.) and classify the mapping as aligned, somewhat aligned, completely unaligned, or not applicable.
12. Repeat this mapping process for all 190 elements.

C. QUANTITATIVE ANALYSIS OF QUALITATIVE DATA

Completing the qualitative analysis of qualitative data through the above process resulted in the mapping of 1,085 DOD PM competency elements to PMI knowledge areas and domains. While the lexicographic analysis process was a significant first step in fulfilling the objectives of this research project, its results would be useless if numbers were not applied. The next logical step in unveiling the level of alignment between the two organizations' standards is to apply quantitative analysis to the completed competency map. The quantitative analysis enables the researcher to simplify the extensive and discombobulated findings of the qualitative analysis through summarization.

1. Classification of Alignment

It is impossible to perform an accurate quantitative analysis on qualitative data without first transforming the qualitative data into a numeric, matrix format (Bernard, 1996). This transition to a matrix format was partly completed in conjunction with the qualitative analysis by classifying each element mapping as either aligned, somewhat

aligned, completely unaligned, or not applicable. These classifications were determined as follows:

- **Aligned (Green/"G"):** The description of the DOD PM competency element clearly aligned with the processes of one or more knowledge areas of the *PMBOK Guide* or one or more elements of *TSPgM* or *TSPfM* performance domains. Indicators included exact, or comparable, lexicon and application.
- **Somewhat Aligned (Yellow/"Y"):** The description of the DOD PM competency element was partially aligned with the processes of one or more knowledge area of the *PMBOK Guide* or elements of *TSPgM* or *TSPfM* performance domains. Indicators included similar or related lexicon, but dissimilar application of the concepts.
- **Completely Unaligned (Red/"RR"):** The description of the DOD PM competency element was not aligned with any processes of the *PMBOK Guide's* knowledge areas or elements of *TSPgM* or *TSPfM* performance domains. The only indicator was the absence of similar content and descriptors.
- **Not Applicable (Black/"N/A"):** Certain DOD PM competency elements were designated as not applicable in the MacStravic (2016) memorandum at the basic and intermediate level because they only apply at the intermediate or advanced level of DOD program management.

The analysis was completed in this sequence to remove any duplication of effort. Had the researcher completed the qualitative analysis (element mapping process) before starting the first stage of the quantitative analysis (classifying the elements' degree of alignment), it would have been necessary for the researcher to review every element mapping a second time to ensure the alignment classifications were accurate. It is important to recognize that although a competency element may be labeled somewhat aligned with a PMI knowledge area or domain, it still signifies that the two are somewhat similar. However, the competency elements labeled as completely unaligned with PMI knowledge areas and/or domains signifies that there are no similarities between the DOD element and the PMI standards.

2. Codifying Alignment

As the researcher completed the qualitative mapping process, a color-coding system was applied to signify the degree of alignment for each element mapping (green = aligned; yellow = somewhat aligned; red = completely unaligned; See Table 2). Upon

completing the qualitative analysis and color-coding of aligned classification, the researcher added a column that codified the color-coded system. Green (aligned) classifications defined as "G"; yellow (somewhat aligned) classifications defined as "Y"; red (completely unaligned) classifications defined as "RR"; black (not applicable) classifications defined as "N/A." This coding system enabled the researcher to use Microsoft Excel's =CountIf function to rapidly calculate the number of instances that DOD PM competency elements were not applicable, aligned, somewhat aligned, or completely unaligned with PMI's *PMBOK Guide*, *TSPgM*, and *TSPfM.*

Table 2. Classifying and Codifying Alignment

Classification	Code	DOD PM competency elements' relationship with PMI	Indicators
Aligned	G	Clearly aligned	Exact, or comparable verbiage and application
Somewhat Aligned	Y	Partially aligned, or could be interpreted as such	Similar verbiage. Dissimilar application
Completely Unaligned	RR	Not aligned	No similarities
Not Applicable	N/A	Not aligned	See MacStravic (2016)

3. Codifying Knowledge Areas and Performance Management Domains

The next step in the quantitative analysis was to codify the knowledge areas and performance domains annotated in the element mapping as instances of alignment (See Table 3, Table 4, and Table 5). Several of the mapped elements aligned with multiple knowledge areas and performance management domains. Take the DOD PM category for Acquisition Management's Program Execution (AM3) competency unit's Element 3.4.1, Program Oversight for the basic, intermediate, and advanced DAWIA levels as examples:

a. Basic Element (DAWIA Level I): "Understand that program reviews and assessments evaluate the cost, schedule, and performance of the program."

- Classified as aligned with the *PMBOK Guide* and aligned with the following processes: 6.6 – Control Schedule, 7.4 – Control Costs, 8.1 – Plan Quality Management, 8.2 – Manage Quality, and 8.3 – Control Quality. The

knowledge areas mapped to this basic element include 6 – Project Schedule Management, 7 – Project Cost Management, and 8 – Project Quality Management (See Table 3 and Figure 10).

b. Intermediate Element (DAWIA Level II): "Participate in program reviews and assessments providing cost, schedule, and performance of the program."

- Classified as somewhat aligned with the *PMBOK Guide* and somewhat aligned with the following processes: 6.6 – Control Schedule, 7.4 – Control Costs, 8.1 – Plan Quality Management, 8.2 – Manage Quality, and 8.3 – Control Quality. The knowledge areas mapped to this intermediate element include 6 – Project Schedule Management, 7 – Project Cost Management, and 8 – Project Quality Management (See Table 3).
- Classified as aligned with *TSPgM* and aligned with the following domain sections: 6.1 – Program Governance Practices and 7.2 – Program Activities and Integration Management. The performance management domains mapped to this intermediate element included 6 – Program Governance and 7 – Program Life Cycle Management (See Table 4).

c. Advanced Element (DAWIA Level III): "Develop strategies for effectively conducting program reviews and assessments regarding cost, schedule, and performance of the program."

- Classified as somewhat aligned with the *PMBOK Guide* and somewhat aligned with the following processes: 6.1 – Plan Schedule Management, 7.1 – Plan Cost Management, and 8.1 – Plan Quality Management. The knowledge areas mapped to this advanced element include 6 – Plan Schedule Management, 7 – Plan Cost Management, and 8 – Plan Quality Management (See Table 3).
- Classified as somewhat aligned with *TSPgM* and somewhat aligned with the following domain section: 6.1 – Program Governance Practices. The program management performance domain mapped to this advanced element is 6 – Program Governance (See Table 4).
- Classified as aligned with the *TSPfM* and aligned with the following domain sections: 4.3 – Guiding Principles, 4.5 – Effective Portfolio Governance Design Factors, 7.7 – Assuring Value, 7.8 – Realizing Value, and 7.9 – Measuring Value. The portfolio management performance domains mapped to this advanced element include 4 – Portfolio Governance and 7 – Portfolio Value Management (See Table 5).

This process was completed for all 190 DOD PM competency elements. To aid in organizing and documenting, the researcher created columns that documented which

codified knowledge areas and domains aligned with each DOD PM competency element (see Figure 10).

Table 3. Codified Labeling of *PMBOK Guide* Knowledge Areas. Adapted from PMI (2017a)

***PMBOK Guide* Knowledge Areas**		
Knowledge Areas	**Coded Label**	**Classification**
Introduction **The Environment in Which Projects Operate** **The Role of the Project Manager**	1 2 3	Elements Across All Knowledge Areas
Project Integration Management	4	Knowledge Area
Project Scope Management	5	Knowledge Area
Project Schedule Management	6	Knowledge Area
Project Cost Management	7	Knowledge Area
Project Quality Management	8	Knowledge Area
Project Resource Management	9	Knowledge Area
Project Communications Management	10	Knowledge Area
Project Risk Management	11	Knowledge Area
Project Procurement Management	12	Knowledge Area
Project Stakeholder Management	13	Knowledge Area

Table 4. Codified Labeling of *TSPgM* Performance Domains. Adapted from PMI (2017c)

***TSPgM* Program Management Performance Domains**		
***TSPgM* Sections**	**Coded Label**	**Classification**
Introduction **Program Management Performance Domains** **Program Activities**	1 2 8	Elements Across All Domains
Program Strategy Alignment	3	Domain
Program Benefits Management	4	Domain
Program Stakeholder Engagement	5	Domain
Program Governance	6	Domain
Program Life Cycle Management	7	Domain

Table 5. Codified Labeling of *TSPgM* Performance Domains. Adapted from PMI (2017b)

***TSPfM* Portfolio Management Performance Domains**		
***TSPfM* Sections**	**Coded Label**	**Classification**
Introduction	1	Elements Across All Domains
The Portfolio Life Cycle	2	Domain
Portfolio Strategic Management	3	Domain
Portfolio Governance	4	Domain
Portfolio Capacity and Capability Management	5	Domain
Portfolio Stakeholder Engagement	6	Domain
Portfolio Value Management	7	Domain
Portfolio Risk Management	8	Domain

Unit of Competency	Comp #	Competency Name	Element #	Basic Competency Element Description	KA	KA	KA	KA	Alignment Code	Basic *PMBOK Guide* Equivalent
Program Execution	3.3	Teaming	3.3.3	Develop a basic understanding of how contractors develop and implement strategies for priming, subcontracting and teaming and how those strategies reflect a variety of desired	12				Y	12.1 Plan Procurement Management
Program Execution	3.3	Teaming	3.3.4	Understand that there are internal and external customers and stakeholders with needs.	13				G	13.1 Identify Stakeholders 13.2 Plan Stakeholder Management
Program Execution	3.4	Program Oversight	3.4.1	Understand that program reviews and assessments evaluate the cost, schedule, and performance of the program.	6	7	8		G	6.6 Control Schedule 7.4 Control Costs 8.1 Plan Quality Management 8.2 Manage Quality Management 8.3 Control Quality
Program Execution	3.4	Program Oversight	3.4.2	Understand that the program is required to conduct technical assessments of prime and subcontractors.	8	11	12		Y	8.1 Plan Quality Management 11.1 Plan Risk Management 12.3 Plan Procurement Management

Figure 10. Excerpt of Competency Map with Codified Alignment and Knowledge Areas for Basic Elements 3.3.3 – 3.4.2. Adapted from MacStravic (2016).

4. Data Synthesis and Organization

Once the degree of alignment was codified, and the competencies were mapped to codified knowledge areas and performance domains, it was necessary to synthesize and organize the data to interpret it accurately. To complete the synthesis, the researcher developed six Microsoft Excel sheets: one for every comparison made between the DOD PM competencies and PMI knowledge areas/domains, as referenced earlier in this chapter. Each sheet tabulated the number of instances that PMI knowledge areas and domains mapped to each DOD PM unit of competency element and broke those mappings down to the different alignment categories. For example, the *PMBOK Guide* knowledge area Project Integration Management aligned with 24 of the DOD PM basic unit of competency elements, somewhat aligned with nine, and was unaligned with 10.

D. RESEARCH LIMITATIONS

This section outlines the researcher's limitations in performing this research.

1. Lack of Professional Experience

While the researcher holds a DAWIA Level I Certification in Program Management and is a PMI-certified Project Management Professional, he does not hold PMI certifications in program or portfolio management and is a DOD contracting officer, not a program manager. This could have impacted the mapping process's accuracy for program and portfolio management standards to the DOD program management competency elements. Future research should incorporate the opinions of experienced personnel with program and or portfolio management expertise.

2. Analytical Mappings Were Completed by a Single Researcher

Due to the nature of the lexicographic, qualitative analyses, and the fact that a single researcher completed the analysis, the results are inherently subjective. Conducting the research with a single opinion and perspective potentially harms the validity of the resulting data and subsequent recommendations.

IV. DATA ANALYSIS

This chapter contains the results of the qualitative and quantitative data analyses performed in Chapter III and answers the research questions posed in the first chapter:

- To what extent are the DOD's 2016 program management functional career field competencies aligned with PMI's *PMBOK Guide*, *TSPgM,* and *TSPfM*? Which PMI standard is the most aligned?
- To what extent are the basic, intermediate, and advanced DOD program management functional career field competencies aligned with the PMI standards?
- To what extent do the DOD's program management competency elements align with PMI's *PMBOK Guide*, *TSPgM*, and *TSPfM*?
- To what extent do the DOD's program management competency units align with PMI's *PMBOK Guide*, *TSPgM*, and *TSPfM*?
- To what extent do PMI's *PMBOK Guide, TSPgM*, and *TSPfM* align with the DOD program management functional career field competency elements?

A. QUESTION 1 RESPONSE: ALIGNMENT OF DOD COMPETENCIES TO PMI STANDARDS

This section answers the primary question that the research sought to answer: To what extent are the DOD's 2016 program management functional career field competencies aligned with PMI's *PMBOK Guide, TSPgM,* and *TSPfM?* Which PMI standard is the most aligned? Finding the answer required a combination of qualitative data organization, as described in Chapter III, and quantitative data analysis.

The first step taken in the quantitative analysis was to count how many DOD competency elements were mapped to PMI's *PMBOK Guide, TSPgM,* and *TSPfM*, and were classified as *aligned*, *somewhat aligned*, *completely unaligned*, or *N/A*. The results are shown in Table 6:

Table 6. Quantity of DOD PM Competency Elements Mapped to PMI's Standards (Organized by Level of Alignment and DAWIA Level)

	Basic *PMBOK Guide*	Intermediate *PMBOK Guide*	Intermediate *TSPgM*	Advanced *PMBOK Guide*	Advanced *TSPgM*	Advanced *TSPfM*
Aligned	**73**	**65**	**52**	**56**	**47**	**47**
Somewhat Aligned	**66**	**83**	**98**	**99**	**115**	**116**
Completely Unaligned	**20**	**29**	**27**	**35**	**28**	**27**
N/A	**31**	**13**	**13**	**0**	**0**	**0**
	190	**190**	**190**	**190**	**190**	**190**

The second step was to categorize the findings by PMI standard. A *PMBOK Guide* category was created by combining the basic, intermediate, and advanced elements that mapped to the *PMBOK Guide*. A *TSPgM* category was created by combining the intermediate and advanced elements that mapped to *TSPgM*. And the sole *TSPfM* category stood alone. A fourth category was included that combined the findings across all three PMI standards to demonstrate the extent of alignment between the DOD PM competencies and the PMI standards for when all PMI standards were applied. For example, if a single element was labeled as aligned under the *PMBOK Guide* but completely unaligned under *TSPgM* and *TSPfM*, it would be classified as aligned under the All PMI category. This method demonstrates the value of applying all three PMI standards in DOD PM training instead of only the *PMBOK Guide*. Finally, a fifth category was applied that shows the number of elements categorized as 100% aligned, somewhat aligned, or completely unaligned with the *PMBOK Guide, TSPgM,* and *TSPfM*. This category is significant because it shows that when all three PMI standards are applied, only eight of 190 DOD PM competency elements are completely unaligned with the PMI standards. The results are shown in Table 7:

Table 7. Quantity of DOD PM Competency Elements Mapped to PMI's Standards (Organized by Level of Alignment)

	PMBOK Guide	*TSPgM*	*TSPfM*	All PMI	100% Across All PMI
Aligned	**194**	**99**	**47**	**115**	**15**
Somewhat Aligned	**248**	**213**	**116**	**67**	**27**
Completely Unaligned	**84**	**55**	**27**	**8**	**8**
N/A	**44**	**13**	**0**	**0**	**0**
	570	**380**	**190**	**190**	

The third step was a simple calculation of percentage. For example, to find the percent of alignment between the DOD PM competency elements and the *PMBOK* Guide, the researcher divided the quantity of DOD PM competency elements that mapped to the *PMBOK Guide* by the 540 total competency mappings (194/570 = 34%). According to the research, the DOD PM competencies align with the *PMBOK Guide*, *TSPgM* and *TSPfM* as depicted in Table 8:

Table 8. Extent that the DOD PM Competency Elements Align with PMI Standards

	PMBOK Guide	*TSPgM*	*TSPfM*	All PMI
Aligned	**34%**	**26%**	**25%**	**61%**
Somewhat Aligned	**44%**	**56%**	**61%**	**35%**
Completely Unaligned	**15%**	**14%**	**14%**	**4%**
N/A	**8%**	**3%**	**0%**	**0%**

The above data are further reflected by four pie charts in Figure 11 to better demonstrate the variety of alignment.

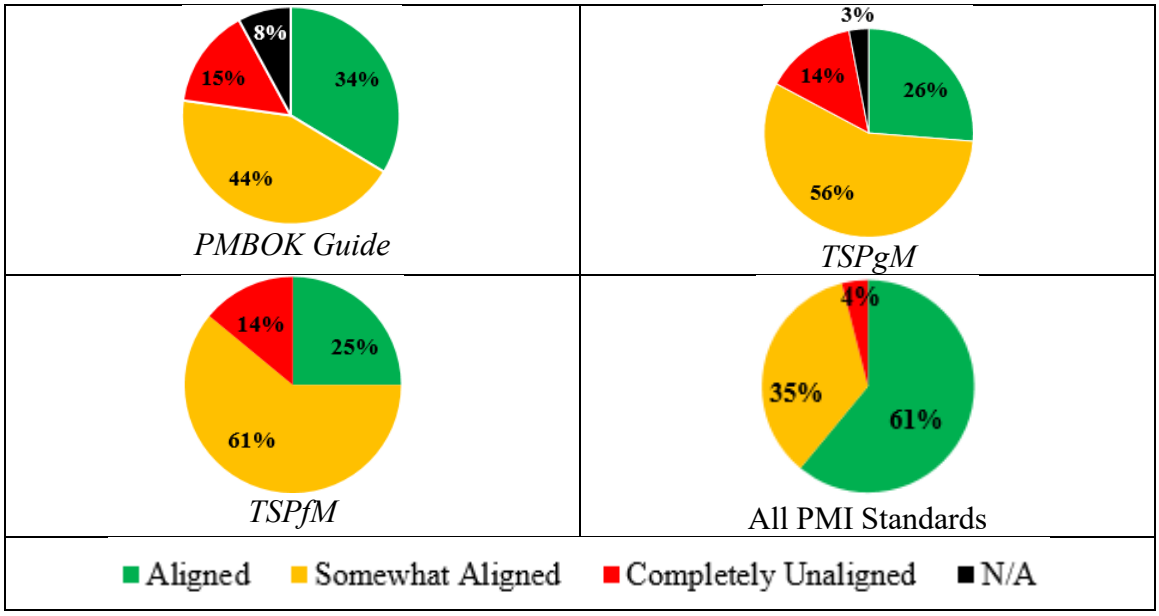


Figure 11. Extent That the DOD PM Competency Elements Align to the PMI Standards by Pie Chart

Based on these findings, it is evident that the *PMBOK Guide* is the PMI standard that is most aligned with the DOD PM competency elements. This is not unexpected, as

the *PMBOK Guide* serves as the building block for *TSPgM* and *TSPfM* and is the broadest of the three standards. However, by adding *TSPgM* and *TSPfM* standards to the standards of the *PMBOK Guide*, the alignment level of the PMI standards with the DOD PM competencies increases by 27% from 34% to 61%. Furthermore, the percentage of elements that are categorized as completely unaligned or not applicable decreases from 15% to 4% and 8% to 0%, respectively.

While the above tables and figures within this section provide a summary of alignment between the DOD PM competencies and the PMI standards, they fail to provide sufficient detail in determining which DOD PM competency elements need to be improved upon to ensure they sufficiently align with the PMI standards. Figures 12 – 15 further elaborate on the impact achieved when applying all three PMI standards, as opposed to only one. These figures provide a visualization of the progressive improvement in alignment as all three PMI standards are applied. Figure 12, Figure 13, Figure 14, and Figure 15 demonstrate the different levels of alignment within the Acquisition Management, Business Management, Technical Management, and Executive Leadership DOD PM Categories, respectively.

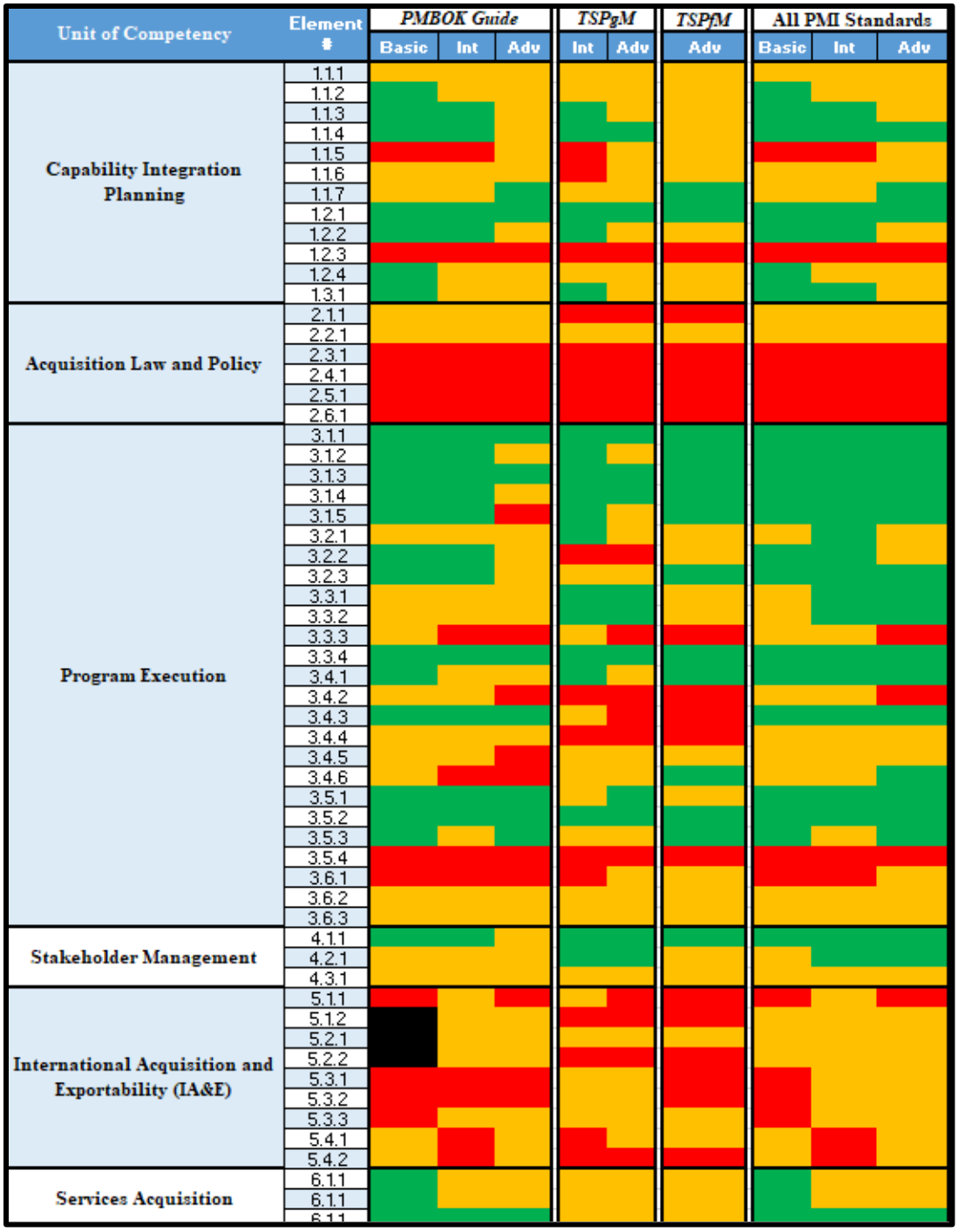


Figure 12. Alignment of Acquisition Management DOD PM Category by PMI Standard

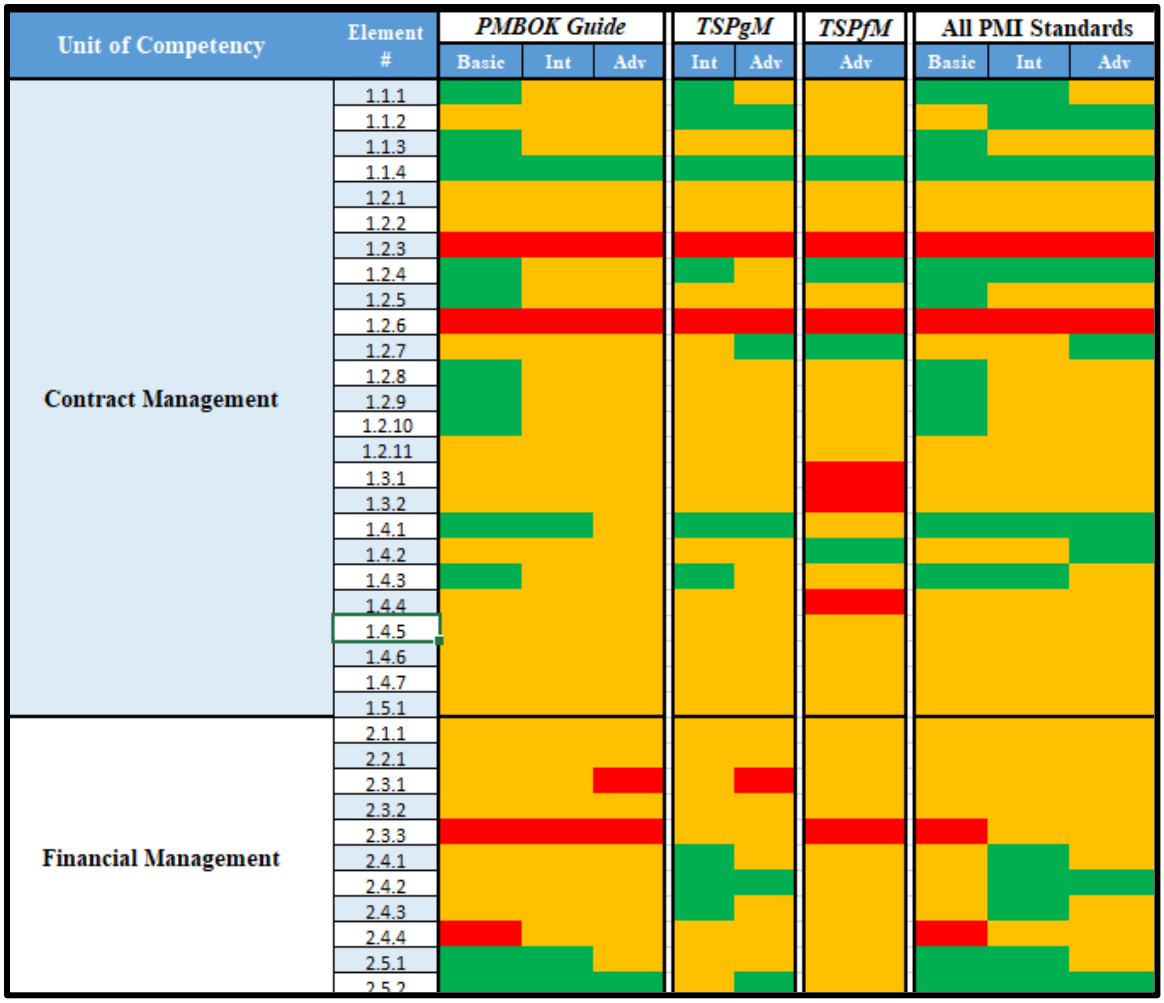


Figure 13. Alignment of Business Management DOD PM Category by PMI Standard

Figure 14. Alignment of Technical Management DOD PM Category by PMI Standard

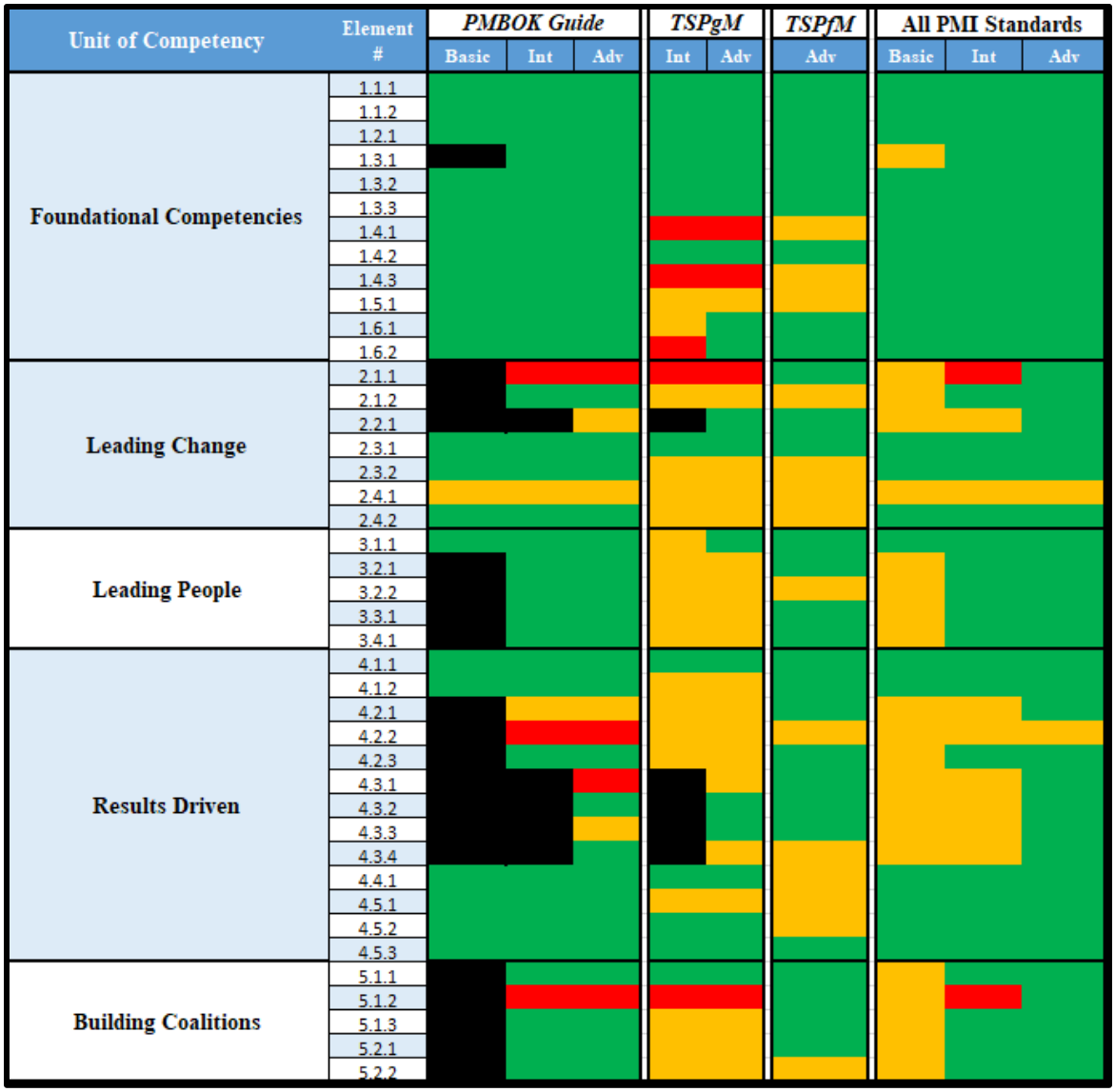


Figure 15. Alignment of Executive Leadership DOD PM Management Category by PMI Standard

The visualizations in each of the figures enabled the researcher to see how incorporating all three PMI standards improves the alignment levels in each of the DOD PM Categories. By circumstance, the visualizations also provided a clear view of which DOD PM category is least aligned with the PMI standards. The Acquisition Management DOD PM category from Figure 12 contains the two DOD PM units of competency that are the least aligned across all three PMI standards. They include Acquisition Law and Policy (0% aligned, 33% somewhat aligned, and 67% completely unaligned) and the International Acquisition and Exportability (0% aligned, 74% somewhat aligned, and 26% completely

unaligned) units of competency. This does not come as a surprise since these two units of competency are mostly exclusive to the DOD's nature of work, and would not contain lexicon that would be commonplace in an industry standard. Therefore, these two units of competency would need to be analyzed further to see how to best incorporate them into the DOD's PM training standards.

B. QUESTION 2 RESPONSE: ALIGNMENT OF DAWIA LEVELS TO PMI STNADARDS

This section responds to the supplementary question that the research sought to answer: To what extent are the basic, intermediate, and advanced DOD program management functional career field competencies aligned with the three PMI standards? Answering this question enables DOD-educating organizations such as the DAU to analyze the extent to which their curriculum aligns with the PMI standards by DAWIA level. More specifically, the DAU will be able to use these findings to see which set of classes (i.e., basic/Level I, intermediate/Level II, advanced/Level III) need the most restructuring in order to comply with the FY2020 NDAA's requirement to base certification standards on third-party (PMI) standards.

As mentioned, six mappings were made between the three PMI standards and the three DAWIA levels of the DOD PM competency elements:

- *PMBOK* to basic elements
- *PMBOK* to intermediate elements
- *TSPgM* to intermediate elements
- *PMBOK* to advanced elements
- *TSPgM* to advanced elements
- *TSPfM* to advanced elements

To simplify the analysis of the findings, the research combined the six mappings by categories of DAWIA levels (basic/Level I, intermediate/Level II, advanced/Level III). The breakdown and findings are documented below and reflected in Figure 16 and Figure 17.

- **Basic Category- DAWIA Level I:** Alignment from the *PMBOK Guide* to basic DOD PM competency elements.

- **Intermediate Category/DAWIA Level II:** Alignment from the *PMBOK Guide* and *TSPgM* to the intermediate DOD PM competency elements.
- **Advanced Category/DAWIA Level III:** Alignment from the *PMBOK Guide*, *TSPgM*, and *TSPfM* to the advanced DOD PM competency elements.

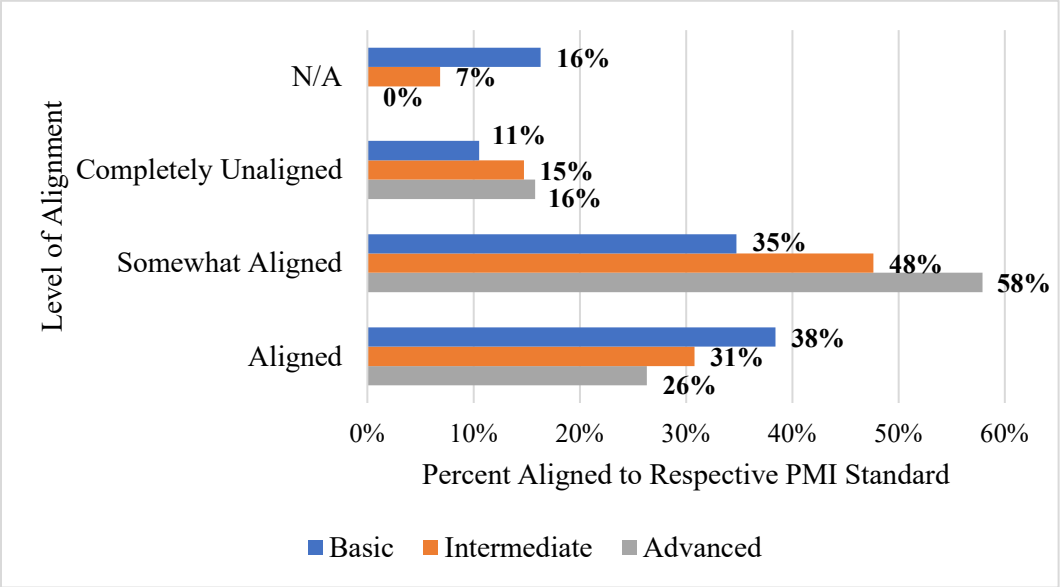


Figure 16. Level of Alignment by DOD PM Competency DAWIA Level (Basic, Intermediate, and Advanced)

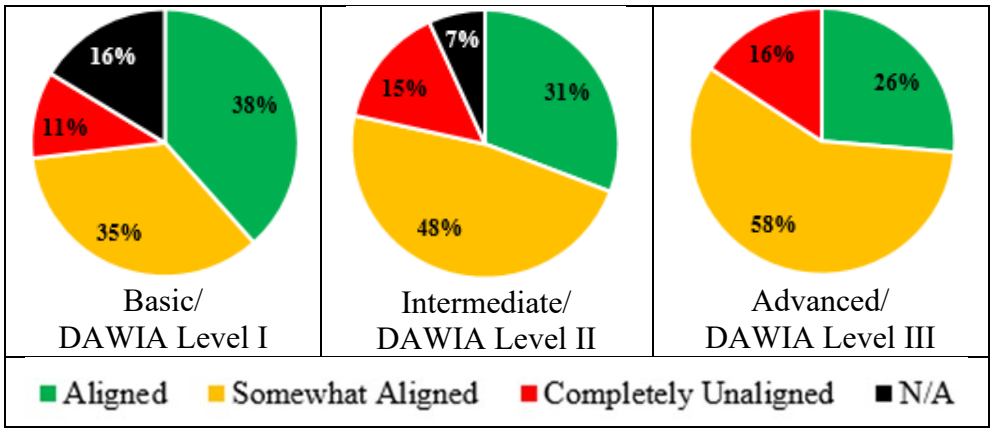


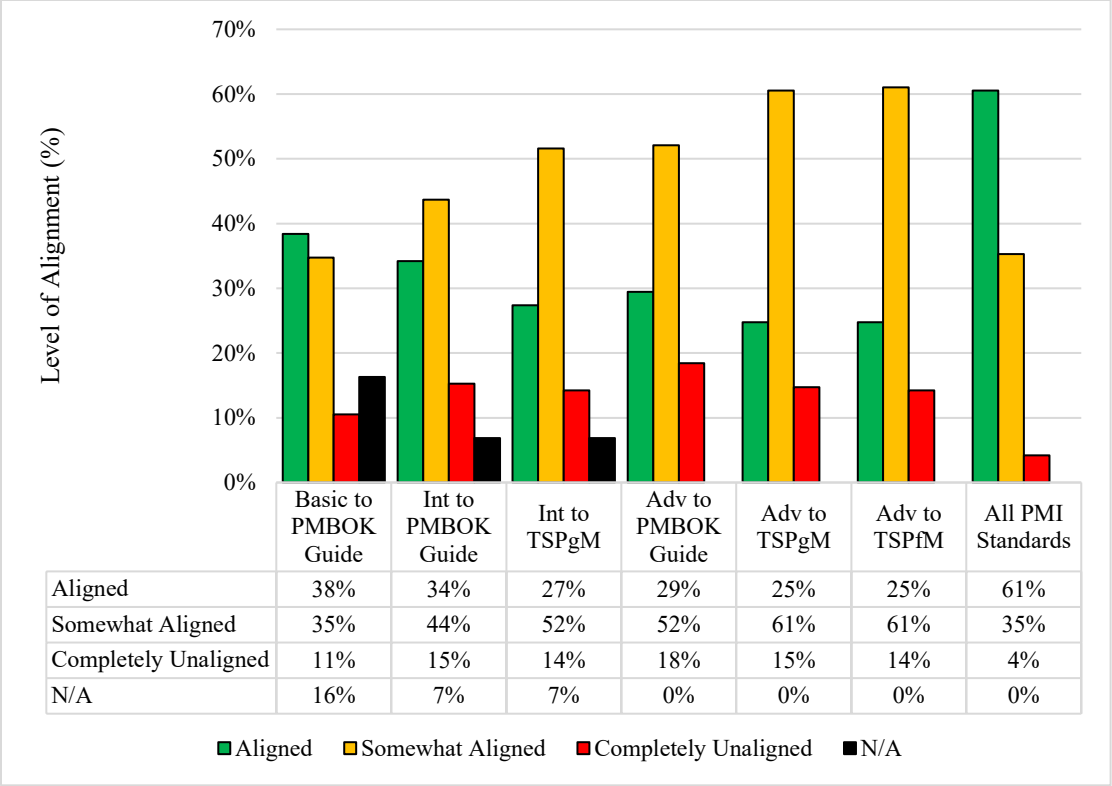
Figure 17. Level of Alignment by DOD PM Competency DAWIA Level by Pie Chart

Based on these findings, it is evident that the basic/DAWIA Level I is the category with the highest rate of alignment to the PMI standards. Following this are the intermediate/DAWIA Level II and then advanced/DAWIA Level III categories. These

findings indicate that of the three DAWIA Levels, the courses that comprise the requirements to obtain the program management DAWIA Level I are the most aligned with the FY2020 NDAA requirement to base training standards on accredited third-party (PMI) standards, whereas the courses making up the DAWIA Level II and III certification requirements are less aligned and will require a greater level of adjustment in order to be sufficiently based on PMI standards, per the NDAA.

C. QUESTION 3 RESPONSE: ALIGNMENT OF DOD COMPETENCY ELEMENTS TO PMI STANDARDS

This section responds to the supplementary question that the research sought to answer: To what extent do the DOD's PM competency elements align with PMI's *PMBOK Guide*, *TSPgM*, and *TSPfM*? Specifically, this section demonstrates the analytical findings from mapping each PMI standard to each DOD PM competency DAWIA levels. These findings can aid the DAU in assigning PMI material to DOD program managers based on level of experience (i.e., basic, intermediate, advanced). As was previously discussed, six mappings were made and are elaborated upon in Figure 18.



	Basic to PMBOK Guide	Int to PMBOK Guide	Int to TSPgM	Adv to PMBOK Guide	Adv to TSPgM	Adv to TSPfM	All PMI Standards
Aligned	38%	34%	27%	29%	25%	25%	61%
Somewhat Aligned	35%	44%	52%	52%	61%	61%	35%
Completely Unaligned	11%	15%	14%	18%	15%	14%	4%
N/A	16%	7%	7%	0%	0%	0%	0%

Figure 18. DOD PM Competency Alignment by DAWIA Level & PMI Standards

1. *The PMBOK Guide* to Basic Elements

This competency mapping resulted with the following data: 38% aligned, 35% somewhat aligned, 11% completely unaligned, and 16% not applicable.

- This competency mapping had the highest rate of alignment and the lowest rate of complete unalignment among the six mapping efforts that were made. Furthermore, the competency mapping was the only one with more elements that were aligned versus somewhat aligned to its respective PMI standard.

2. *The PMBOK Guide* to Intermediate Elements

This competency mapping compared the competencies of the *PMBOK Guide* and the DOD's intermediate PM competency elements. The results are as follows: 34% aligned, 44% somewhat aligned, 15 % completely unaligned, and 7% not applicable.

- This competency mapping had the second highest rate of alignment among the six mapping efforts.

3. *TSPgM* to Intermediate Elements

This competency mapping compared the competencies of *TSPgM* and the DOD's intermediate PM competency elements. The results are as follows: 29% aligned, 52% somewhat aligned, 18% completely unaligned, and 7% not applicable.

4. *The PMBOK Guide* to Advanced Elements

This competency mapping compared the knowledge areas and process of the *PMBOK Guide* and the DOD's advanced PM competency elements. The results are as follows: 29% aligned, 52% somewhat aligned, 18% completely unaligned, and 0% not applicable.

- This competency mapping was the most aligned with the PMI standards of the three categories of advanced PM competency elements. However, it was also mapping effort that contained the most PM competency elements that were completely unaligned with its respective PMI standard. The extent to which this mapping effort is completely unaligned is likely due to the foundational aspects of the PMBOK Guide and the high-level, descriptive characteristics of the advanced DOD competencies.

5. *TSPgM* to Advanced Elements

This competency mapping compared the domain areas of *TSPgM* and the DOD's advanced PM competency elements. The results are as follows: 25% aligned, 61% somewhat aligned, 15% completely unaligned, and 0% not applicable.

- Key takeaways from this mapping is that it tied for the most DOD PM competency elements that are somewhat aligned. This indicates that further research must be done to discover the true level of alignment between *TSPgM* and the advanced DOD PM elements.

6. *TSPfM* to Advanced Elements

This competency mapping is the only one that considers *TSPfM* due to its high level of scope. The researcher compared the domain areas of *TSPfM* to the DOD's advanced PM competency elements. The results nearly exactly mirror that of the mapping effort between TSPgM and the advanced elements: 25% aligned, 61% somewhat aligned, 14% completely unaligned, and 0% not applicable.

- This mapping tied with the *TSPgM* to advanced DOD PM competency elements for having the highest rate of somewhat aligned mappings. This indicates that further research must be done to discover the true level of alignment between *TSPgM* and the advanced DOD PM elements.

7. All PMI Standards to All Elements

Similar to the efforts made in responding to Question 1, the researcher applied an analysis of alignment when the DOD PM competency elements were mapped to all three PMI standards. The extensive analysis resulted in the DOD PM competency elements being 61% aligned, 35% somewhat aligned, only 4% completely unaligned, and 0% not applicable.

- This inclusive mapping far exceeded the level of alignment of the other six mappings by up to 36%, and exhibited the lowest level of complete unalignment by up to 11%.

By analyzing the itemized mappings, the research discovered that the mappings that included PMI's *TSPgM* and *TSPfM* had the highest rate of somewhat aligned mappings. This could have been caused by the differing levels of specificity between the highly specific competency descriptions of the DOD's advanced elements and the high scope, low specific content of PMI's *TSPgM* and *TSPfM*. While the three mappings involving the *PMBOK Guide* exhibited higher rates of alignment than the mappings involving *TSPgM* and *TSPfM*, the difference pales in comparison to the mapping of all PMI standards to the DOD PM competencies.

D. QUESTION 4 RESPONSE: ALIGNMENT OF DOD UNITS OF COMPETENCY TO PMI STANDARDS

This section responds to the question: To what extent do the DOD's program management units of competency align with the three PMI standards? The analyses shown in this section are similar to the analysis in performed in the response to question 1 in Section A of this chapter. The primary difference is that while that section demonstrated the level of alignment for every element, this section analyzes the level of alignment from a broader, more categorized perspective by combining the elements into their respective DOD PM category. The four DOD PM categories include Acquisition Management, Business Management, Technical Management, and Executive Leadership. Essentially, the

findings in this section simplify the DOD's task of restructuring their PM functional competency elements to better align with the PMI standards, per the FY2020 NDAA.

1. Alignment of DOD Units of Competency to the *PMBOK Guide*

This analysis shows the level of alignment between the *PMBOK Guide* and the DOD's four program management competency categories. As discussed, the mappings that involved the *PMBOK Guide* included the DOD's basic, intermediate, and advanced element descriptions. Summarization of the data can be seen in Figure 19.

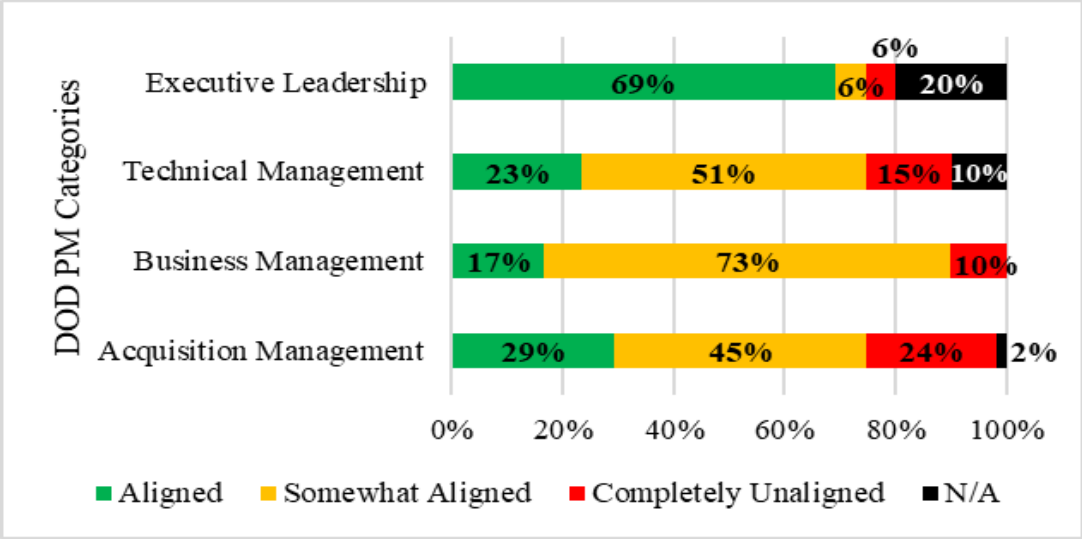


Figure 19. Alignment of DOD PM Categories to the *PMBOK Guide*

Acquisition Management: This DOD PM Category demonstrated an alignment level of 29% to the *PMBOK Guide*. This means that of the 174 element descriptions that comprise the Acquisition Management category, 51 of them were aligned with at least one of the knowledge areas of the *PMBOK Guide*. Likewise, 79 element descriptions (45%) were somewhat aligned, 41 (24%) were completely unaligned, and 3 (2%) were not applicable.

Business Management: This DOD PM category demonstrated an alignment level to the *PMBOK Guide* of 17%, the lowest alignment across the four units. This indicates that of the 108 element descriptions that comprise the Business Management category, 18

of them were aligned with at least one of the knowledge areas of the *PMBOK Guide*. Similarly, 79 element descriptions (73%) were somewhat aligned, 11 (10%) were completely unaligned, and 0 were not applicable.

Technical Management: This DOD PM category demonstrated an alignment level to the *PMBOK Guide* of 23%. This indicates that of the 162 element descriptions that comprise the Technical Management category, 38 of them were aligned with at least one of the knowledge areas of the *PMBOK Guide*. Similarly, 83 element descriptions (51%) were somewhat aligned, 25 (15%) were completely unaligned, and 16 (10%) were not applicable.

Executive Leadership: This DOD PM category demonstrated an alignment level to the *PMBOK Guide* of 69%, far exceeding the other PM categories. This indicates that of the 126 element descriptions that comprise the Executive Leadership category, 87 of them were aligned with at least one of the knowledge areas of the *PMBOK Guide*. Similarly, 7 element descriptions (6%) were somewhat aligned, 7 (6%) were completely unaligned, and 25 (20%) were not applicable.

2. Alignment of DOD Units of Competency to *TSPgM*

This analysis shows the level of alignment between *TSPgM* and the DOD's four PM categories. As discussed, the mappings that involved *TSPgM* included the DOD's intermediate and advanced element descriptions. Summarization of the data can be seen in Figure 20.

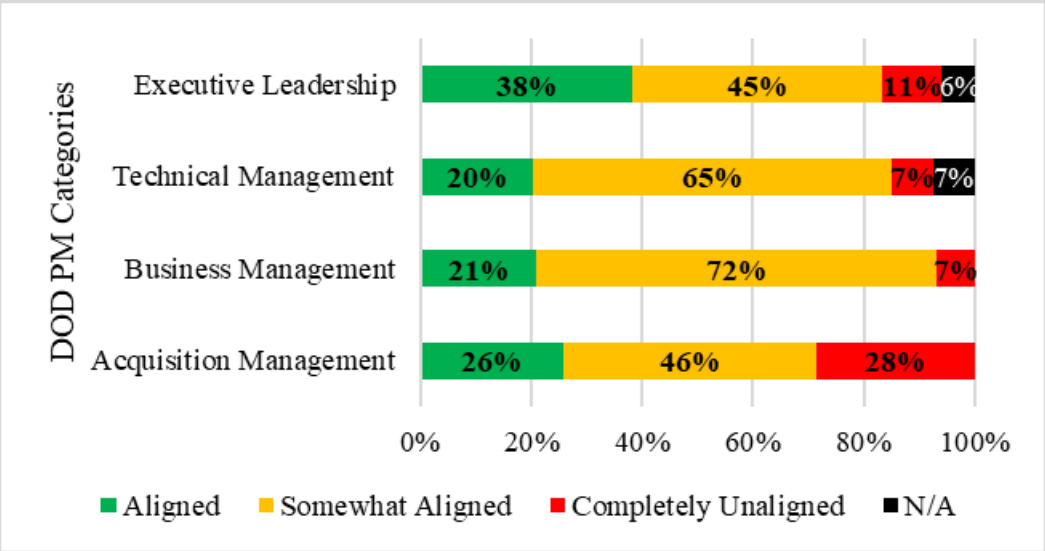


Figure 20. Alignment of DOD PM Categories to *TSPgM*

Acquisition Management: This DOD PM category demonstrated an alignment level of 26% to the *TSPgM*. This means that of the 116 element descriptions that comprise the Acquisition Management category, 30 of them were aligned with at least one of the performance domains of *TSPgM*. Likewise, 53 element descriptions (46%) were somewhat aligned, 33 (28%) were completely unaligned, and 0 not applicable.

Business Management: This DOD PM category demonstrated an alignment level to *TSPgM* of 21%. This indicates that of the 72 element descriptions that comprise the Business Management category, 15 of them were aligned with at least one of the performance domains of *TSPgM*. Similarly, 52 (72%) element descriptions were somewhat aligned, 5 (7%) were completely unaligned, and 0 were not applicable.

Technical Management: This DOD PM category demonstrated an alignment level to *TSPgM* of 20%, the lowest level of alignment across the four categories. This indicates that of the 108 element descriptions that comprise the Technical Management category, 22 of them were aligned with at least one of the performance domains of *TSPgM*. Similarly, 70 element descriptions (65%) were somewhat aligned, 8 (8%) were completely unaligned, and 8 (8%) were not applicable.

Executive Leadership: This DOD PM category demonstrated an alignment level to *TSPgM* of 38%, far exceeding the other competency units. This indicates that of the 84 element descriptions that comprise the Executive Leadership category, 32 of them were

aligned with at least one of the performance domains of *TSPgM*. Similarly, 38 element descriptions (45%) were somewhat aligned, 9 (11%) were completely unaligned, and 5 (6%) were not applicable.

3. Alignment of DOD Units of Competency to *TSPfM*

This analysis shows the level of alignment between *TSPfM* and the DOD's four PM categories. As discussed, the mappings that involved *TSPfM* included only the DOD's advanced element descriptions. Summarization of the data can be seen if Figure 21.

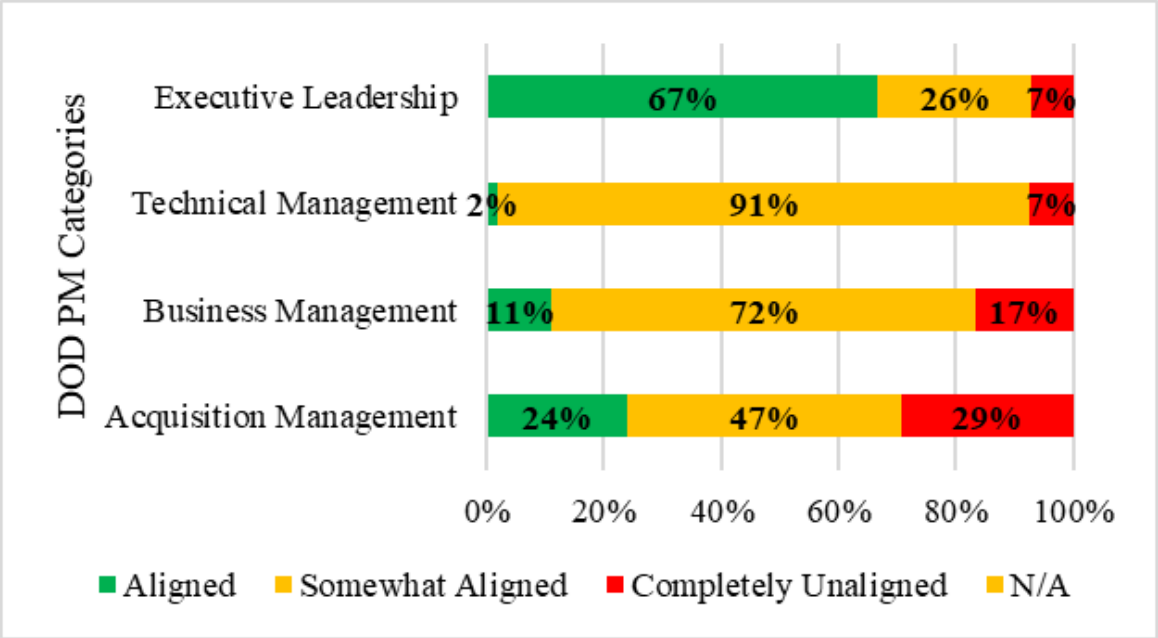


Figure 21. Alignment of DOD PM Categories to *TSPfM*

Acquisition Management: This PM category demonstrated an alignment level of 24% to the *TSPfM*. This means that of the 58 element descriptions that comprise the Acquisition Management category, 14 of them were aligned with at least one of the performance domains of *TSPfM*. Likewise, 27 element descriptions (47%) were somewhat aligned, 17 (29%) were completely unaligned, and 0 were not applicable.

Business Management: This PM category demonstrated an alignment level to *TSPfM* of 11%. This indicates that of the 36 element descriptions that comprise the Business Management category, 4 of them were aligned with at least one of the

performance domains of *TSPfM*. Similarly, 26 element descriptions (72%) were somewhat aligned, 6 (17%) were completely unaligned, and 0 were not applicable.

Technical Management: This DOD PM category demonstrated an alignment level to *TSPfM* of 2%, the lowest alignment across the four categories. This indicates that of the 54 element descriptions that comprise the Technical Management category, 1 of them was aligned with at least one of the performance domains of *TSPfM*. Similarly, 49 element descriptions (91%) were somewhat aligned, 4 (7%) were completely unaligned, and 0 were not applicable.

Executive Leadership: This DOD PM category demonstrated an alignment level to *TSPfM* of 67%, far exceeding the other competency units. This indicates that of the 42 element descriptions that comprise the Executive Leadership category, 28 of them were aligned with at least one of the performance domains of *TSPfM*. Similarly, 11 element descriptions (26%) were somewhat aligned, 3 (7%) were completely unaligned, and 0 were not applicable.

To see the extent to which the four DOD PM categories aligned with the PMI standards as a whole, the researcher combined the number of mappings for each alignment level across all three PMI standards. This resulted in Figure 22, which demonstrates that Executive Leadership is clearly the most aligned PM category. Following Executive Leadership is Acquisition Management, which is also the most completely unaligned category. While Technical Management and Business Management are mostly similar, Business Management has more elements that are completely unaligned. The presence of the completely unaligned elements in the Acquisition Management and Business Management DOD PM categories is most likely caused by the DOD-specific nature and Government nuance in the following units of competency: Acquisition Law & Policy, International Acquisition & Exportability, and Contract Management).

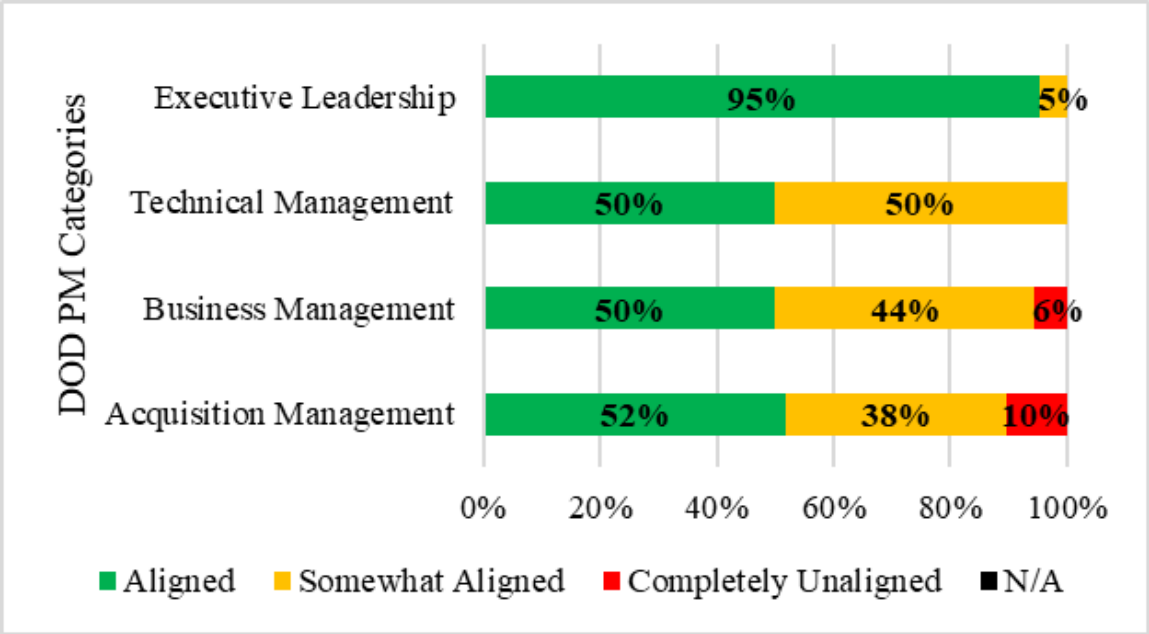


Figure 22. Alignment of DOD PM Categories to the PMI Standards

Based on the above findings, it is evident that the DOD PM category with the highest level of alignment across all PMI standards is Executive Leadership. The second most aligned category is Acquisition Management, followed by Technical Management and finally Business Management. Additionally, the PMI standard that demonstrated the greatest level of alignment across all DOD PM categories was the *PMBOK Guide*, but it should be noted that the level of alignment across all DOD PM categories increases significantly when all PMI standards are applied. Furthermore, the completely unaligned elements are categorized as such due to their government-specific nature and further research should be conducted to determine how to best implement them into DOD PM training.

E. MOST AND LEAST ALIGNED PMI KNOWLEDGE AREAS AND PERFORMANCE DOMAINS

This section provides a breakdown of the competency mapping by the *PMBOK Guide* project management knowledge areas, *TSPgM* program management performance domains, and *TSPfM* portfolio management performance domains to answer the question: What PMI knowledge areas and performance domains are most aligned and least aligned with the DOD program management functional career field competency elements?

Analyzing the level of alignment between the DOD's PM functional career field competencies and the PMI standards at this minute level enables DOD and PMI officials to see which knowledge area(s)/domain(s) are not being applied in the DOD's competencies. The primary purpose of this section is to highlight the knowledge areas and performance domains that are least aligned with the DOD's PM functional career field competencies.

The first step taken in this quantitative analysis required looking at the codified cells described in Section C of Chapter III. These cells contained the coded knowledge areas and performance domains for every DOD PM competency element and distinguished the elements by three levels of alignment: aligned, somewhat aligned, or completely unaligned. The completely unaligned category of alignment was ignored in this section because every element that was classified as such, was unable to be mapped to either a knowledge area or a performance domain and would have therefore proven to be 0% across each and every PMI standard. While the somewhat aligned category has been distinguished from the aligned category up to this point, it has been combined with the aligned category for the purpose of responding to this research question. The elements categorized as somewhat aligned contain similar lexicon and/or content to the PMI knowledge areas and performance domains. It is for these similarities that these elements were combined with the elements categorized as aligned.

In responding to the preceding research questions, the analysis was completed by mapping the PMI knowledge areas and performance domains to the DOD's PM competency elements. This involved reading the descriptions of each DOD PM competency element and determining the PMI knowledge areas and domains that best matched them. However, to effectively answer this section's research question, the analysis required the reverse approach—a mapping of the DOD's PM competency elements to the PMI knowledge areas and performance domains. This involved reading PMI's knowledge areas and performance domains first and then determining the DOD PM competency elements that best matched them. This process enabled the tallying of each knowledge area and performance domain that aligned with the DOD PM competency elements. This distinction is critical in understanding the data demonstrated in this section.

1. Alignment of the *PMBOK Guide* Knowledge Areas to DOD Competency Elements

This section demonstrates the extent to which each of the *PMBOK Guide*'s 10 knowledge areas and Elements Across all Knowledge Areas align with the DOD program management competency elements. Answering this question enables DOD stakeholders like the DAU to focus on the most relevant *PMBOK Guide* project management knowledge areas when restructuring their certification curriculum. The following paragraphs describe the findings and elaborate on the key points of Figure 23.

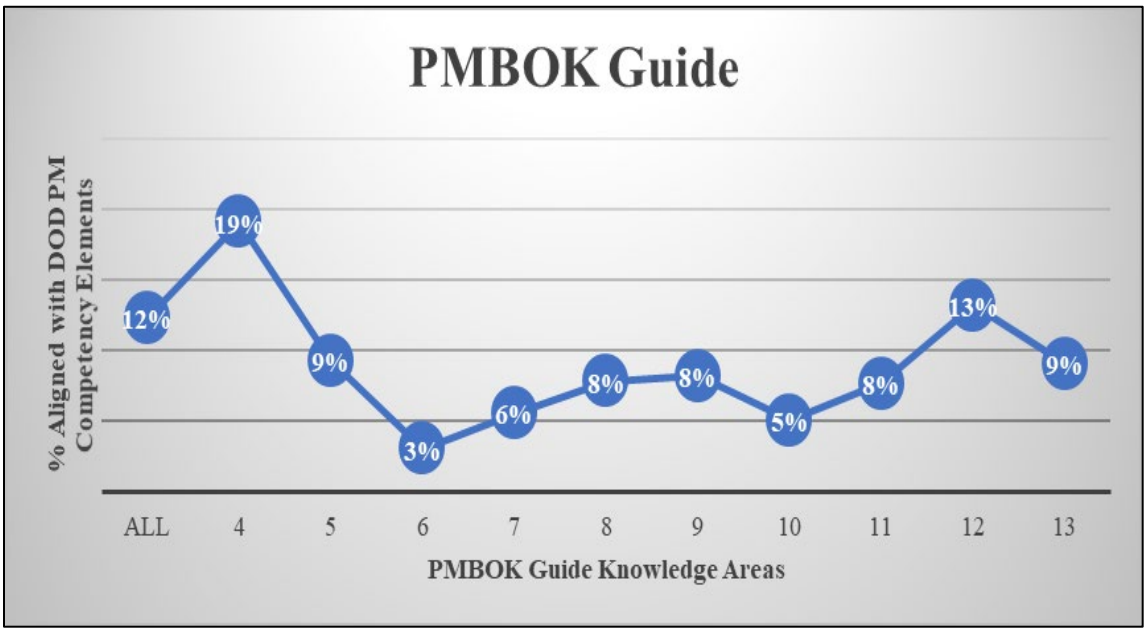


Figure 23. Alignment of the *PMBOK Guide* Project Management Knowledge Areas to DOD Competency Elements

The knowledge areas that exhibited the greatest level of alignment include 4 – Project Integration Management, 12 – Project Procurement Management, and All - Elements Across All Knowledge Areas.

- **4 – Project Integration Management:** This knowledge area made up 19% of all the aligned and somewhat aligned DOD PM competency elements—more than any other section. Project Integration Management includes the processes that coordinate all processes that spread across every *PMBOK Guide* process group (initiating, planning, executing, monitoring and controlling, and closing), and thus unify a project/program's life cycle.

- **12 – Project Procurement Management:** This knowledge area made up 13% of all the aligned and somewhat aligned elements. Due to the high quantity of services and acquisitions within the DOD that rely on contract management, this knowledge area could be considered critical to include in the training of DOD PMs. It should be noted, that while this was the second most aligned knowledge area, it also mapped most to the Contract Management DOD PM unit of competency, which falls under the second most completely unaligned DOD PM category: Business Management. Therefore, more research should be conducted in how well this knowledge area aligns with the DOD PM functional competencies.
- **All – Elements Across All Knowledge Areas:** This pseudo knowledge area consists of *PMBOK Guide* sections 1 – Introduction, 2 – The Environment in Which Projects Operate, and 3 – The Role of the Project Manager. While these sections are not *PMBOK Guide* project management knowledge areas, they contain a great deal of information regarding project management and should not be ignored in updating or developing new DOD PM standards. This section demonstrated 12% alignment with the basic, intermediate, and advanced elements of the DOD PM competencies.

The knowledge areas that exhibited the lowest level of alignment include 6 – Project Schedule Management, 10 – Project Communications Management, and 7 – Project Cost Management.

- **6 – Project Schedule Management:** This knowledge area made up only 3% of the aligned and somewhat aligned DOD PM competency elements. This deficiency in alignment is particularly concerning because managing schedule is one of the three project management tenants that make up the iron triangle/triple constraint of project management. (Atkinson, 1999). The other two tenants are cost management and scope management. The concept behind the triple constraint is that cost is a function of scope and schedule—meaning if one of the three (cost, schedule or scope) increases or decreases, one or both of the other two will be inversely impacted. Understanding how to manage the triple constraint is critical for project and program managers, for if the three components are not well planned, executed, monitored or controlled, then the project's or program's success could be put in jeopardy.
- **7 – Project Cost Management:** This knowledge area made up 6% of the aligned and somewhat aligned DOD PM competency elements. As stated, cost management is one of the three components of the iron triangle and is therefore critical in project management.
- **10 – Project Communications Management:** This knowledge area made up only 5% of the aligned and somewhat aligned DOD PM competency elements. The impact that communications management can have on a project cannot be overstated.

To summarize, the least aligned *PMBOK Guide* knowledge areas include project cost, schedule and communications management. Two of these three are related to the iron triangle which, if not well managed, can significantly impact project outcomes for the worse. The fact that the DOD PM competencies do not align well with these PMBOK Guide sections may be cause for concern because it is an indicator that the DOD is not adequately training their PMs on the importance of managing schedule, cost, and communications—at least in the realm of formal education.

2. Alignment of *TSPgM* Performance Domains to DOD Competency Elements

This section demonstrates the extent to which each of *TSPgM*'s program management performance domains—and elements across all domains—align with the intermediate and advanced DOD PM competency elements. Answering this question enables DOD stakeholders like the DAU to focus on the most relevant *TSPgM* program management performance domains when restructuring their certification curriculum. The following paragraphs describe the researcher's findings and elaborate on the key points of Figure 24.

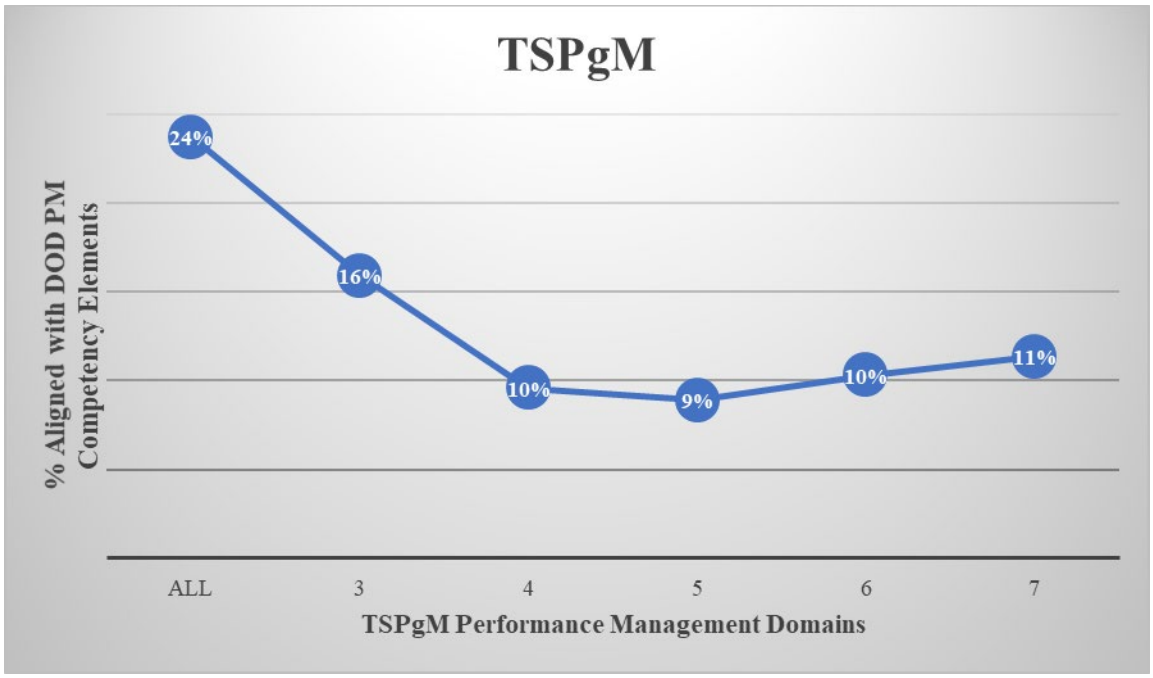


Figure 24. Alignment of *TSPgM* Program Management Performance Domains to Intermediate and Advanced DOD Competency Elements

The program management performance domains that exhibited the greatest level of alignment include All - Elements Across All Knowledge Areas and 3 – Program Strategy Alignment. The remaining four performance domains exhibited mostly similar levels of alignment (9% - 11%).

- **All – Elements Across All Program Management Performance Domains:** This pseudo domain consists of *TSPgM* sections 1 – Introduction, 2 – Program Management Performance Domains, and 8 – Program Activities. While these sections are not *TSPgM* program management performance domains, they contain a great deal of information regarding program management and should not be ignored in updating or developing new DOD PM standards. This section makes up 24% of the DOD PM elements that were categorized as aligned or somewhat aligned.
- **3 – Program Strategy Alignment:** The contents of this performance domain identify "program outputs and outcomes to provide benefits aligned with the organization's strategic goals and objectives" (PMI, 2017c. p. 33). It is a good thing that the DOD PM competencies emphasize this performance domain because of the high number of portfolios and programs managed by the DOD. Providing training on organizational strategy and benefits management enables DOD program managers, portfolio managers, and other DOD acquisition leaders to effectively develop, align and manage agency-wide acquisition and capability objectives.

3. Alignment of *TSPfM* Performance Domains to DOD Competency Elements

This section demonstrates the extent to which each of *TSPfM*'s portfolio management performance domains—and elements across all domains—align with the advanced DOD PM competency elements. Answering this question enables DOD stakeholders like the DAU to focus on the most relevant *TSPfM* program management performance domains when restructuring their certification curriculum. The following paragraphs describe the researcher's findings and elaborate on the key points of Figure 25.

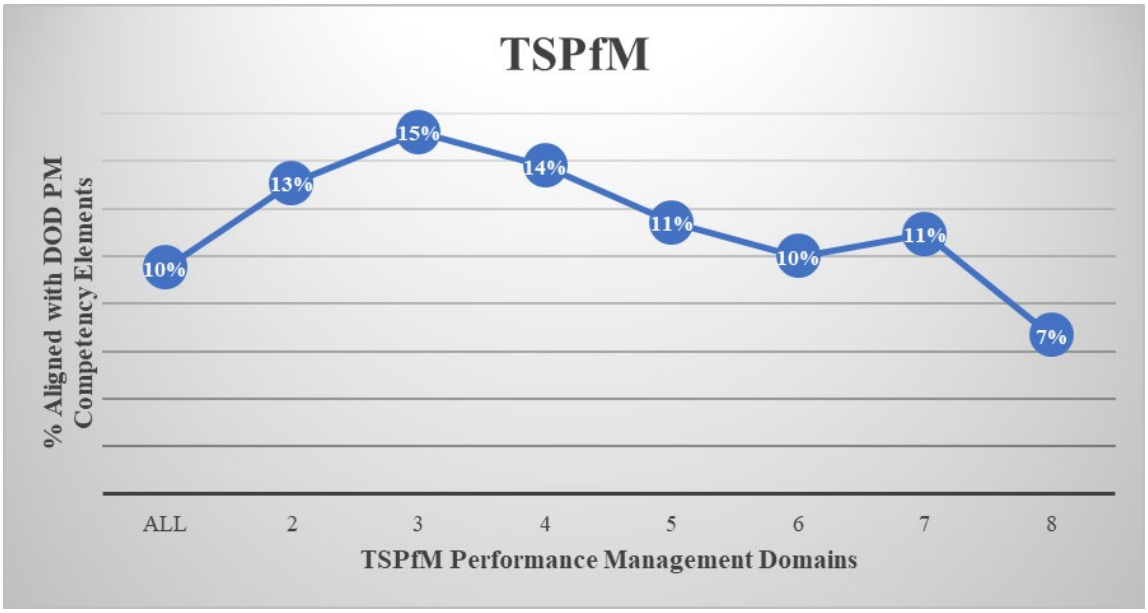


Figure 25. Alignment of TSPfM Portfolio Management Performance Domains to Advanced DOD Competency Elements

The portfolio management performance domains that exhibited the greatest level of alignment include 2 – The Portfolio Life Cycle, 3 – Program Strategic Management, and 4 – Portfolio Governance.

- **2—The Portfolio Life Cycle:** Just as the *PMBOK Guide* Project Integration Management knowledge area was highly aligned with the DOD PM competencies, so too is this performance domain (13%). These two are comparable due to their ongoing nature. Project Integration Management (PMI, 2017a) and Portfolio Life Cycle Management heavily rely on information systems that enable effective communication and support seamless and timely transitions between project and life cycle phases (PMI,

2017b). Due to the criticality of this performance domain, the DOD should continue to promote this as a highly aligned domain.

- **3—Portfolio Strategic Management:** This performance domain makes up 15% of the aligned DOD PM competencies. Decisions relying on strategic alignment are exclusive made at the executive level.
- **4 – Portfolio Governance:** This performance domain makes up 14% of the aligned DOD PM competency elements. The effective implementation of Portfolio Governance aids an organization in becoming auditable (Rendon & Rendon, 2015). Implementing this domain into DOD PM training will offer guidance on ensuring portfolio oversight, effective reporting structures, and stakeholder management.

The performance domain that exhibited the lowest level of alignment was 8 – Portfolio Risk Management.

- **8 – Portfolio Risk Management:** This domain made up the lowest number of aligned DOD PM elements. This indicates that the current DOD PM competency elements do not include many elements related to risk management at the advanced level. The DOD must remedy this issue in order to improve their PMs ability to identify, analyze and manage risks. By successfully identifying and analyzing risks, the DOD will be able to develop more accurate cost and schedule management plans and estimates. This will hypothetically lead to fewer cost and schedule overruns, and empower DOD PMs to develop more successful acquisition strategies that account for risks.

This section answered the research question: What PMI knowledge areas and performance domains are most and least aligned with the DOD program management functional career field competency elements? From a high-level perspective, the *PMBOK Guide* proved to be the most aligned, *TSPgM* is the second most aligned, and *TSPfM* is the least aligned. These findings are consistent with other analytical methods that used the first directional mapping described at the beginning of this section. The more specific findings are detailed throughout this section. The three patterns detected in responding to this research question, was that knowledge areas and performance domains that were most aligned with the DOD's PM competency elements included concepts for strategic management, life cycle management, and overarching concepts as indicated by the "Elements Across all Knowledge Areas/Performance Domains" identifier. The most concerning finding from this research was the discovery of the poorly aligned schedule and cost management knowledge areas. This is a highly important and foundational project

management skill that DOD PMs must obtain early and improve upon throughout their careers.

F. CONCLUSION

This chapter utilized the qualitative analyses performed in Chapter III to answer the five research questions:

1. To what extent are the DOD's 2016 program management competency elements aligned with PMI's *PMBOK Guide*, *TSPgM,* and *TSPfM*? Which PMI standard is the most aligned?
2. To what extent are the basic, intermediate, and advanced DOD program management competency elements aligned with the PMI standards?
3. To what extent do the DOD's program management competency elements align with PMI's *PMBOK Guide*, *TSPgM*, and *TSPfM* when categorized by DAWIA level?
4. To what extent do the DOD's four program management categories align with PMI's *PMBOK Guide*, *TSPgM*, and *TSPfM*?
5. Which PMI knowledge areas and performance domains are most and least aligned with the DOD program management functional career field competency elements?

The results of this section lay out exactly how the DOD PM competency elements are aligned with the PMI standards. The five results provide five different perspectives on the level of alignment. For example, the alignment of DOD PM competencies with each and all PMI standards by element, DAWIA level, DOD PM category, by both element and DAWIA level, and through visual sensitivity analyses of how the alignment levels change when additional PMI standards are added to the competency mapping. The methodologies and results of this section should be used to highlight areas of unalignment that should be improved upon, and areas of high alignment that should be exploited in the implementation of future updated DOD PM functional career field competencies and training.

V. CONCLUSIONS AND RECOMMENDATIONS

This research project was intended to provide the DOD with information and recommendations necessary to effectively respond to the FY 2020 NDAA's (2019) mandate to base all acquisition workforce certification requirements on nationally or internationally recognized third-party standards. The ultimate goal of the NDAA's mandate is to improve the quality of the DOD's program management workforce through effective training. As globally recognized standards, PMI's *PMBOK Guide*, *TSPgM*, and *TSPfM* serve as excellent foundations on which to base the DOD's program management certification requirements. The following sections consist of the researcher's findings, recommendations, and areas for future research that the researcher garnered through an extensive literature review, qualitative analyses, and quantitative analyses.

A. FINDINGS

The information presented in Table 9 is derived from the researcher's five research questions posed at the beginning of this paper and elaborated on in the data analysis chapter.

Table 9. Consolidated Research Findings

1. To what extent are the DOD's 2016 program management competency elements aligned with the PMI's *PMBOK Guide*, *TSPgM*, and *TSPfM*? Which PMI standard is the most aligned?			
PMBOK Guide	***TSPgM***	***TSPfM***	**All PMI Standards**
34% Aligned (Most Aligned)	26% Aligned	25% Aligned	61% Aligned

2. To what extent are the basic, intermediate, and advanced DOD program management competency elements aligned with the PMI Standards?		
Basic (DAWIA Level I)	**Intermediate (DAWIA Level II)**	**Advanced (DAWIA Level III)**
38% Aligned	31% Aligned	26% Aligned

3. To what extent do the DOD's program management competency elements align with PMI's *PMBOK Guide*, *TSPgM*, and *TSPfM*?			
	PMBOK Guide	***TSPgM***	***TSPfM***
Basic (DAWIA Level I)	38% Aligned		
Intermediate (DAWIA Level II)	34% Aligned	27% Aligned	
Advanced (DAWIA Level III)	29% Aligned	25% Aligned	25% Aligned

4. To what extent do the DOD's PM categories align with PMI's *PMBOK Guide*, *TSPgM*, and *TSPfM*?				
	PMBOK Guide	***TSPgM***	***TSPfM***	**All PMI Standards**
Acquisition Management	29%	26%	24%	52%
Business Management	17%	21%	11%	50%
Technical Management	23%	20%	2%	50%
Executive Leadership	69%	38%	67%	95%

5. What PMI knowledge areas and performance domains are most and least aligned with the DOD program management functional career field competency elements?	
***PMBOK Guide* Knowledge Areas**	
Most Aligned	**Least Aligned**
All – Elements Across All Knowledge Areas	6 – Project Schedule Management
4 – Project Integration Management	7 – Project Cost Management
13 – Project Stakeholder Management	10 – Project Communications Management
***TSPgM* Performance Domains**	
Most Aligned	**Least Aligned**
All – Elements Across All Performance Domains	N/A
3 – Program Strategy Alignment	
***TSPfM* Performance Domains**	
Most Aligned	**Least Aligned**
2 – The Portfolio Life Cycle	8 – Portfolio Risk Management
3 – Portfolio Strategic Management	4 – Portfolio Governance
4 – Portfolio Governance	

B. RECOMMENDATIONS

This research was conducted to provide recommendations to the DOD on how to best respond to the NDAA's (2019) mandate to base the acquisition workforce's certification requirements on an accredited third party's standards. The recommendations in this section are based on the researcher's extensive literature review as well as the analyses conducted throughout the research.

1. Base the New DAWIA Certification Requirements On the *PMBOK Guide*, *TSPgM*, and *TSPfM*

A careful review of the literature and an in-depth analysis of the mappings between the DOD's PM functional career field competencies and the PMI standards have led the researcher to believe that the DOD should base their new certification requirements on all three PMI standards. As discussed in the literature review, the progressive complexity and scope of the DAWIA certifications "correlate to the complexity and responsibilities required for designated positions and different types of assignments in weapon systems, services, business management systems and information technology, and international acquisitions" (Redshaw, 2011, p. 55). Because the *PMBOK Guide* is exclusively aimed towards individuals charged with managing temporary endeavors (projects), it would not suffice as the sole source of education for the DOD's program management workforce. For example, many program managers run programs that have existed for decades and manage portfolios that contain a multitude of different projects and programs. Such endeavors require a higher-level managerial perspective and scope of control than the *PMBOK Guide* provides. Therefore, the *PMBOK Guide* would not be able to meet the progressive complexities of the DAWIA certifications and operational responsibilities that are reflected in the DOD's acquisition workforce. By adding *TSPgM* and *TSPfM* to the educational framework of their program managers, the DOD is able to account for the increase in managerial scope that program managers will see as they progress in their careers.

2. Keep the Three-Tiered Certification Model

The DAWIA three-tiered certification model consists of Level I (basic), Level II (intermediate), and Level III (advanced). This progressive education model enables

program managers to be trained on relevant subject matter and prevents them from learning out-of-scope material too early. For example, it would not make sense for a DOD program manager to be trained on portfolio life cycle management when the scope of their responsibilities is to manage small projects at the base level. Furthermore, it would be a disservice to the DOD to have a portfolio executive officer trained on basic project management practices when they should be learning methods of portfolio governance and strategic alignment across projects, programs and portfolios. To guide program managers from an introduction to project management to being capable of running vast programs and portfolios, the DOD must establish a training program that gradually increases in scope in correlation with the scope of the program manager's current job responsibilities. This can be accomplished by establishing certification standards based on the below model:

- DAWIA Level I (basic/project managers) – *PMBOK Guide*
- DAWIA Level II (intermediate/program managers) – *TSPgM*
- DAWIA Level III (advanced/program and portfolio managers) – *TSPfM*

This would allow for a gradual increase in program management knowledge and application. To improve upon this model, the DOD should enable cross-sectioning of the three PMI standards into each certification level. As mentioned, the *PMBOK Guide* serves as the foundation for both *TSPgM* and *TSPfM*, and therefore holds valuable information that should be used in the training of managers of programs and portfolios. Likewise, including sections of *TSPgM* and *TSPfM* with the Level I education allows young DOD program managers to see the larger picture of their career and can help them to better understand the intricacies of the basic project management training.

3. Consider All Three Components of Auditability

In its fulfillment of the NDAA's (2019) mandate, the DOD should consider all aspects of Rendon and Rendon's (2015) conceptual framework for auditability. The framework accounts for internal controls, capable processes, and competent personnel (Rendon & Rendon, 2015). While this research exclusively considered the development of competent personnel through an analysis of training standards, the DOD should ensure that correct measures are being taken in modifying training certifications and in developing effective processes to transition the workforce and the training staff to the new standards.

By considering all three aspects of the auditability framework, the DOD's shift to meeting the NDAA's (2019) mandate will have a greater chance of success.

4. Revitalize the U.S. Department of Defense Extension to PMI's *PMBOK Guide*

In 2003, the DOD and PMI partnered to develop the *U.S. Department of Defense Extension to:* A Guide to the Project Management Body of Knowledge (PMBOK® Guide; DOD & DAU, 2003). The purpose of this extension was to "identify and describe defense applications of the core project management knowledge areas contained in the *PMBOK Guide*" (DOD & DAU, 2003, p. ix). While the extension was never implemented into a DAU curriculum, it was a step in the right direction for the DOD that is now being mandated by the NDAA (2019). The DOD should consider this document and include key elements from *TSPgM* and *TSPfM* in order to provide an adequate resource to DOD program managers at all levels.

5. Repeat the Mapping and Analysis with Multiple Researchers

Due to the nature of lexicographic qualitative analyses, and the fact that the analysis was completed by a single researcher, the results are inherently subjective. I recommend the DOD repeat this mapping process with multiple researchers from PMI the DAU, and operational DOD Program Managers to develop an objective consensus in the competency mappings.

C. AREAS FOR FUTURE RESEARCH

This section considers the results of this research in pointing out areas of research that could further improve the training of DOD acquisition personnel.

1. Determine Optimal Time for Program Managers to Begin Each Certification Training Level.

In the second recommendation, the researcher stated his support for a three-tiered certification model for the DOD program management career field. The success of this model largely depends on the timing with which the program managers begin and complete their training. The ideal timing for when a program manager should begin program

management or portfolio management training should be studied in order to optimize the DAU's educational resources as well as the capabilities of program managers. For example, decision-makers should consider whether program managers should be provided training based on time in position, their scope of responsibility, both, or some other variables?

2. Other Project Management Certifications

While PMI's *PMBOK Guide*, *TSPgM*, and *TSPgM* are globally recognized standards, there are many other sources of education and training for DOD program managers to experience. Some examples include Lean Six Sigma, ISO 9001, PMI's risk management certification, PMI's scheduling professional certification, and so on.

3. Sensitivity Analysis for Impact of Difference in DOD to PMI Lexicon

When the researcher came across a term, process, or concept unfamiliar or uncertain while conducting the mapping process, he turned to professional sources from either the DOD or PMI to fill any gaps in knowledge. Future research should look at how replacing DOD-or PMI-specific language with common language would impact the level of perceived alignment between the two entities' standards.

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Acquisition Research Program
Graduate School of Defense Management
Naval Postgraduate School
555 Dyer Road, Ingersoll Hall
Monterey, CA 93943

www.acquisitionresearch.net