The Middle Tier of Acquisition: Speed vs. Rigor

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Abstract

As the pace of global technological innovation accelerates, maintaining military advantage depends more than ever on rapidly transitioning emerging technologies into operational capabilities. This qualitative study examines the effectiveness of the Middle Tier of Acquisition (MTA) pathway, implemented in 2015 legislation, in delivering timely, relevant military capabilities. The MTA was established to prototype and field systems to address critical capability gaps and evolve platforms at the speed of relevance. Though still a relatively new acquisition instrument, the MTA has demonstrated the ability to streamline rapid prototyping and fielding to counter rising state adversaries. However, recent legislation threatens constraints that could undermine the original expedited intent of MTA authority. This study explores the origins, objectives, and outcomes of MTA implementation through policy reviews, practitioner perspectives, and oversight studies. Findings indicate the MTA meets intended goals of agility and pace, but faces challenges in transparency and integration with other acquisition pathways. Recommendations focus on improving MTA cost estimation and reporting while sustaining MTA's essential responsive advantages. Additional oversight is warranted, but should not sacrifice speed or flexibility. Further research can evaluate long-term MTA performance as more programs reach maturity.

Introduction

The history of materiel acquisition in the U.S. federal government is marked by accelerations and slow-downs, evolutionary changes and revolutionary jumps, and reform across the entire array of acquisition functions (Fox, 2011). As provided in the Department of Defense Directive 5000.01 The Defense Acquisition System, the materiel acquisition process supports the National Defense Strategy, through the development of a more lethal force … and a culture of performance" (Department of Defense, 2020a, p.4). The Middle Tier of Acquisition (MTA) pathway is the product of relatively recent reform efforts precipitated by an overriding need to modernize the U.S. military and "Deliver Performance at the Speed of Relevance" (Department of Defense, 2020a, p.4; GAO, 2019). Speed of relevance refers not only to the adaptation of innovative business practices but also, and perhaps more importantly, to the integration of new technologies with new ways of fighting those technologies (Dowling and Johnson, n.d.). Since implementation in 2018, MTA authority was reviewed and scrutinized, applauded, and criticized. And now, it may be changed. On December 29, 2022, President Biden signed the FY23 omnibus appropriations act which includes new language that increases MTA reporting and certification requirements (Hitchens, 2023). The new language is intended to ensure that MTA authorities are not used to circumvent established rules for defense acquisition (Hitchens, 2023). Critics of the new language, however, claim that it will slow MTA expedited processes and doing so "will ensure that the United States falls behind its adversaries" (Bill Greenwalt as cited in Hitchens, 2023. para. 8). This study examines both sides of the argument. The following is a qualitative study of the effectiveness of the MTA in achieving its original intent: to deliver performance at the speed of relevance.

Background

The 2022 National Defense Strategy "directs the Department of Defense (DoD) to act urgently to sustain and strengthen U.S. deterrence, with the People's Republic of China as the Department's pacing challenge" (Department of Defense, 2022a, p.1). This directive arose some four years after Under Secretary of Defense for Acquisition & Sustainment, The Honorable Ellen Lord, issued interim guidance on MTA implementation. The Department of Defense Directive 5000.01, published in September 2020 states:

> The objective of the Defense Acquisition System (DAS) is to support the National Defense Strategy, through the development of a more lethal force based on U.S. technological innovation and a culture of performance that yields a decisive and sustained U.S. military advantage. (Department of Defense, 2020a, p.4)

In its 2019 report on DoD acquisition reform, just one year after MTA implementation, the Government Accounting Office (GAO) stated, "many of the Department of Defense's (DOD) major defense acquisition programs face challenges delivering innovative technologies to the warfighter to keep pace with evolving threats" (p.1). Three years later, the GAO (GAO, 2023b) reported that programs using the MTA pathway required more oversight. Reflecting the concerns expressed by the GAO report, the FY23 omnibus appropriations act threatened to reintroduce "traditional checks and balances" potentially hindering the speed advantages sought by the original MTA authority (Hitchens, 2023, para. 1).

The National Defense Authorization Acts (NDAA) for 2016 and 2017 included language that reformed defense acquisition "to streamline acquisition oversight and field capabilities faster" (GAO, 2019, "Why GAO Did This Study" section). Specifically, Section 804 of the 2016 NDAA allowed the DoD to rapidly develop fieldable prototypes demonstrating new capabilities

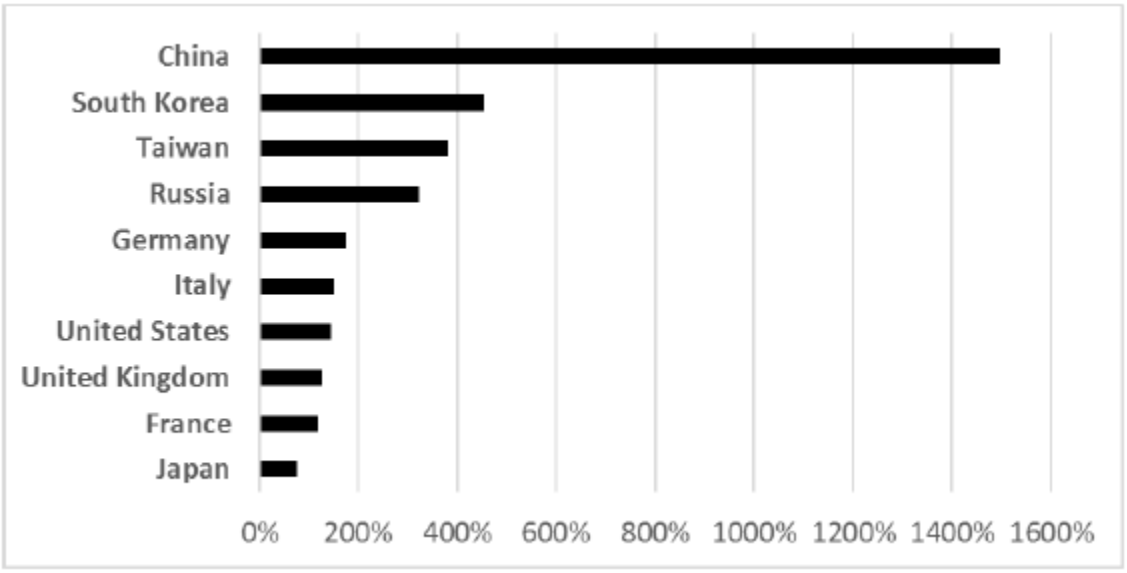
that meet emerging military needs or rapidly field production quantities of new or upgraded systems with proven technologies (Pub. L. No. 114-328 (2016)). Since Secretary Lord issued interim guidance on the implementation of MTA in April 2018, 222 MTA program entries have been registered in the Defense Acquisition Visibility Environment (DAVE), roughly 19 percent of all acquisition programs listed in the DAVE (DAVE, 2023). The DAVE database serves as the central registry for DoD acquisition program data (Office of the Assistant Secretary of Defense, n.d.) While not suitable for all acquisitions, Program Managers (PMs) utilizing the MTA pathway acknowledge its agility and speed (MacGregor, et al, 2022; Kneece, at al, 2016; Stark, 2023). Members of congressional appropriations committees have expressed concerns that the DoD might be misusing MTA authority, potentially obscuring costs and hindering transparency (Hitchens, 2023, para. 3).

Problem Statement

For the last seven decades the U.S. military has maintained a level of technological superiority that has offset the size and geographic advantages of adversaries (Gallo & Sargent, 2021). Our technological dominance has in large part been because of the federal government's Research & Development (R&D) spending over time (Gallo & Sargent, 2021). U.S. dominance, however, is in peril. "A primary challenge to American military technological preeminence is the emergence of China as a potential military adversary and as a science and technology powerhouse" (Gallo & Sargent, 2021. p. 9). Even as U.S. R&D expenditures grew seven-fold from 1960 to 2019 China now outspends the U.S. on R&D 15 to 1 (Gallo & Sargent, 2021). Figure 1 below depicts the growth from 2000 – 2019 in gross expenditures on R&D for selected nations.

Figure 1 R&D Growth for Selected Nations 2000 – 2019

R&D Growth for Selected Nations 2000 - 2019



Note: Chart sourced from CRS analysis of OECD gross expenditures on R&D data measured in purchasing power parity dollars. https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm

R&D Growth for Selected Nations 2000 - 2019

Catching up with China on R&D spending alone will not ensure American preeminence on the future battlefield (Tirpak, 2021). As acting United States Air Force Assistant Secretary for Acquisition, Technology, and Logistics, The Honorable Darlene Costello stated during the Air Force Acquisition forum in 2021, “the old ways of doing business—using paper, ponderous development and test methods, and lengthy sustainment programs—won’t allow USAF to keep up with China” (Tirpak, 2021, para. 2). Emphasizing the point further, Costello also noted that it took China 30 years to field a rival to the F-15 Eagle fighter jet, but only ten years to match the F-22 (Tirpak, 2021). “They’re finding ways to do this faster” Costello said, “we must also” (Tirpak, 2021, para. 4).

Transitioning militarily useful technologies from the laboratory to the battlefield has been a persistent challenge for the Defense Department. This struggle stretches back centuries, even to the Continental Congress's difficulties acquiring and fielding breech loaded rifles and invisible ink. Today, the urgency of addressing this challenge has amplified. The National Defense Strategy emphasizes the need for speed and relevance in adapting to the rapidly evolving national security landscape (Department of Defense, 2022, p.1). The GAO and DoD Inspector General have published multiple reports on MTA authority and programs with findings tending toward criticism (DoDIG, 2023a; GAO, 2023a; GAO, 2023b; GAO, 2021). Advocates of MTA authority claim that "If the U.S. military is to keep up with China, far more defense acquisition programs must move toward MTA and pathways like it" (MacGregor et al., 2022. Conclusions section, para. 2).

Statement of Purpose and Research Questions

The purpose of this study is to examine the effectiveness of the MTA pathway to deliver military capability at the speed of relevance. To achieve this purpose the research presented in this study will answer the following questions:

1. Why was MTA authority established?
2. What is the purpose of MTA authority?
3. Is MTA implementation delivering military capability at the speed of relevance?

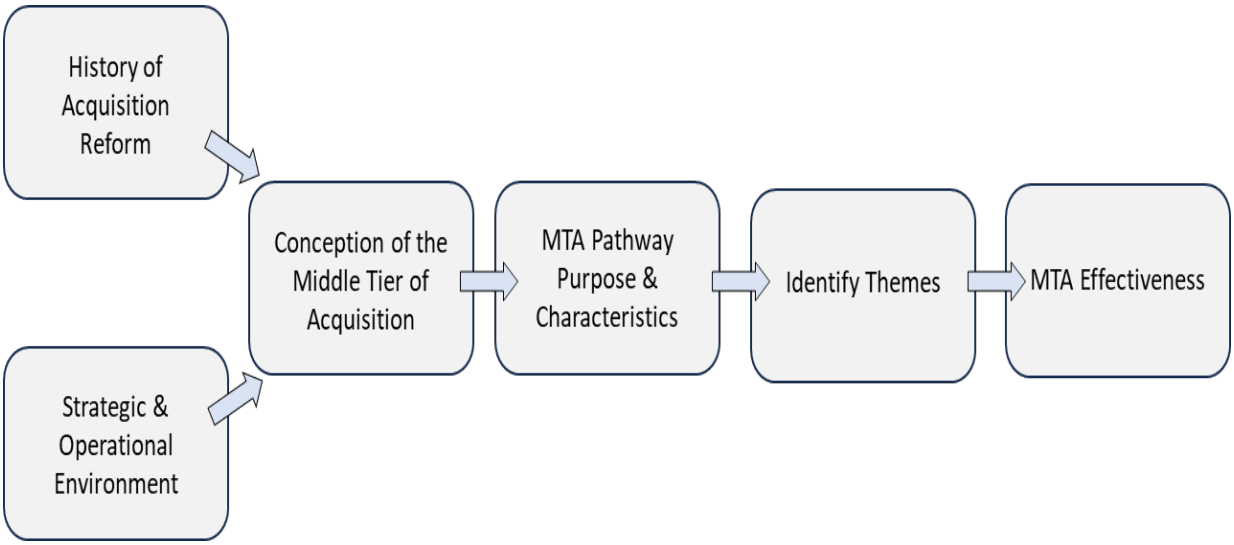
Conceptual Framework

The conceptual framework for this qualitative study is based on the linkages between historical influences in acquisition reform, changes in the national security environment, the resultant emergence of the MTA pathway, and information pertaining to MTA implementation across the DoD. The study describes historical context precipitating the need for acquisition

reform leading to the advent of the MTA pathway. This includes a strategic and operational context that underpins the meaning and significance of the term *speed of relevance*. Next, the study identifies the purpose and characteristics of the MTA pathway through a review of statute, policy, and regulations. Included in this study are descriptions of MTA programs from across the DoD and the perspectives, both critical and complimentary, of those programs, MTA processes, and MTA authority. Themes are identified in the literature articulated in the Findings section of the study from which to draw conclusions regarding MTA's effectiveness. Figure 2 is a graphical representation of the conceptual framework. The graphic shows a logical flow from acquisition reform and the national security environment to examination of effectiveness.

Figure 2 Conceptual Framework

Conceptual Framework



Significance of This Research

Section 804 of the 2016 NDAA authorized the Middle Tier of Acquisition for Rapid Prototyping and Rapid Fielding. Advocates of MTA authority claim that the MTA provides the Defense Department the opportunity to shrink DoD's "bloated" acquisition bureaucracy using an "expedited process waiving the Joint Capabilities Integration and Development System (JCIDS)

and Department of Defense Instruction (DODI) 5000.02 requirements" (Barnes et al., 2016, p. 64). Still others state that MTA's speed and flexibility will enable the DoD to regain technological overmatch with China as the pacing threat (Barnes et al., 2016; May, 2022). Examining the MTA's effectiveness to deliver military capability at the speed of relevance substantiates existing authorities and implementation guidance. Understanding how and why the MTA was conceived and the extent to which it has been employed are necessary components of this research. Reviewing perspectives of the MTA's critics and advocates aids the acquisition community in retaining MTA's speed and flexibility to "yield a decisive and sustained U.S. military advantage" (Department of Defense, 2020a, p. 4; Hitchens, 2023). Finally, understanding the while responding to increasing pressure for additional oversight and transparency.

Overview of the Research Methodology

This research paper uses qualitative methods to describe information and identify themes within literature related to the research subject (Creswell & Creswell, 2018). Characterizing research material into themes allows the researcher to identify recurrences of and links between themes (Bryman, 2008). Additionally, thematic analysis allows the researcher to interpret data beyond the researcher's experience (Bryman, 2008). The research is practical in that the findings, conclusions, and recommendations are intended for practical application in the acquisition profession. The literature review establishes a basis of understanding of the statutes, policies, regulations, and other guidance documentation pertaining to the MTA pathway. The literature review also presents information describing instances of MTA programs across the DoD. Reviews from articles and reports provide perspectives on the MTA pathway and MTA programs to establish a contextual understanding of the MTA's development, purpose, and

usage. The literature review compares and contrasts perspectives of MTA authority and usage to inform findings and conclusions presented later in this study.

Research was informed by materials accessed from multiple databases including ProQuest, EBSCOhost, Lawrence Technical University TechCat+, Defense Technical Information Center (DTIC), Google Scholar, the Defense Acquisition Visibility Environment (DAVE), and the Army Publishing Directorate. Research materials were also compiled from several research libraries including Taylor and Francis, the Historical Office of the Secretary of Defense, the Defense Acquisition University Virtual Research Library, and The Library of Congress. Other online sources provided both historic and contemporary information related to the research subject.

Limitations of the Study

The research presented in this paper has several limitations that should be considered. The scope of this study is limited by period (i.e., 1980 to December 2023). Bounding research by these dates serves two purposes. First, eliminating research prior to 1980 discounts acquisition reform prior to that date potentially identifying critical factors informing acquisition reform. Second, as of December 19, 2023, the FY24 NDAA was not yet been signed by President Biden. Changes to the NDAA after this date may skew the reader's perspective of this study's findings, conclusions, and recommendations. This study is limited to the literature available in the public domain. The scope of research is limited to information pertaining to the MTA, except where references to other acquisition pathways is required to address research questions or provide context. Time allocated to research, review, and preparation for release also limits the extent of research. Finally, as reported in the 2023 Government Accounting Office Report on Middle-Tier Defense Acquisitions, the Under Secretary of Defense for Acquisition and Sustainment (USD(A&S) data reporting framework does not accurately reflect some of the critical data

needed to complete a thorough analysis of MTA programs (Government Accounting Office, 2023b). This limits available data to correlate MTA program information with program outcomes.

Summary

MTA pathway legislation reflects nearly two decades of effort invested by Congress and the Department of Defense to reform and improve the Defense Acquisition System and material acquisition processes (Government Accounting Office, 2023b). The use of the MTA pathway has increased significantly since its inception, growing from 35 active MTA programs in 2019 to 135 by April 2022 (Government Accounting Office, 2023b). The paradigm shifts away from the previous bureaucracy of reports, reviews, and limitations that were made available through MTA statutory authority have also cast the MTA into scrutiny (Hitchens, 2023). Understanding the genesis of the MTA, the parameters of implementation, and characteristics of applications that have achieved intended outcomes will assist the acquisition community in the appropriate use of MTA authority to deliver military capability at the speed of relevance. The literature review in the next section of this study summarizes research, reports, and perspectives on MTA authorities and application in a manner appropriate for readers without in-depth knowledge of defense acquisition.

Literature Review

Introduction

This section examines several categories of literature. First, an overview of the Defense Acquisition System (DAS) will familiarize the reader with overall acquisition processes and functions. The DAS overview orients the reader to the MTA relative to the other acquisition pathways within the DAS. Then, examination of acquisition reform and the strategic and operational environment prior to creation of MTA authority addresses why MTA authority was conceived. Next, a review of statutes, policy, and regulations governing MTA authority and implementation illustrates the purpose of MTA authority and implementing guidance. The literature review then examines examples of MTA programs from across the DoD, providing the reader insight into how MTA authority was implemented. The literature review concludes with an examination of perspectives, both critical and complimentary, of MTA implementation and use. These insights establish the basis for a qualitative analysis of the MTA in achieving its purpose.

Statement of Purpose and Research Questions

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1. Why was MTA authority established?
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The Defense Acquisition System

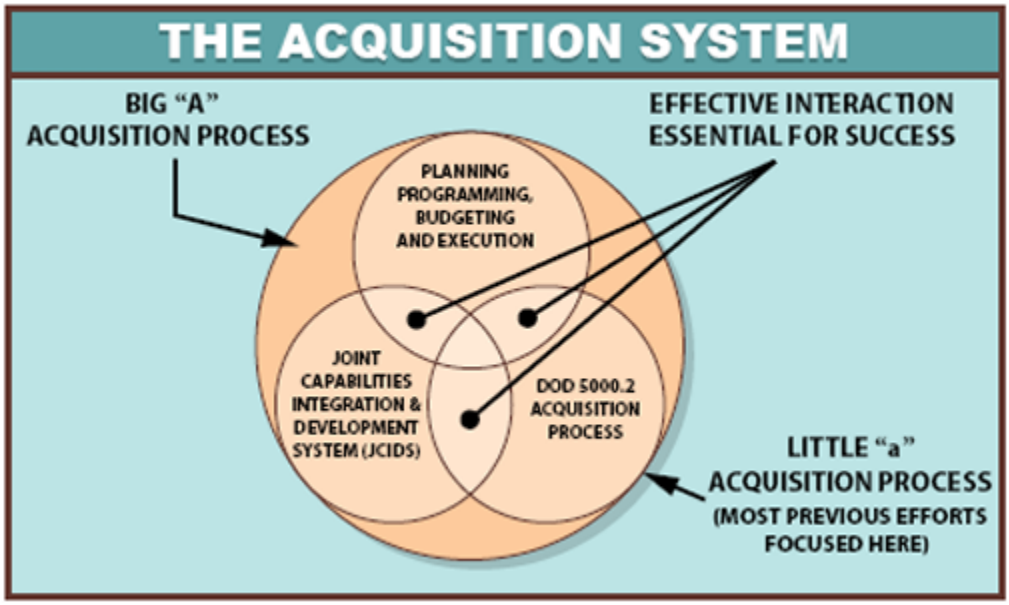
The DoD responds to the national security needs articulated by the President in the National Security Strategy (NSS) by providing the military forces needed to deter war and ensure the nation's security. One of the mechanisms the DoD uses to provide capability to military forces is the Defense Acquisition System. As provided in the DODI 5000.01:

> The objective of the Defense Acquisition System (DAS) is to support the National Defense Strategy, through the development of a more lethal force based on U.S. technological innovation and a culture of performance that yields a decisive and sustained U.S. military advantage. (Department of Defense, 2020a, p. 4)

The DAS is one of three interrelated functions of the DoD Decision Support System. The Joint Capabilities Integration and Development System (JCIDS) identifies capability gaps and generates capability requirements. A capability gap, as defined by the Chairman of the Joint Chiefs of Staff Instruction 5123.01I (2021) is "the inability to meet or exceed a capability requirement, resulting in an associated operational risk…" (p. GL-8). The Planning, Programming, Budgeting, and Execution System (PPBE) applies resources to fill gaps and achieve those capabilities. The DAS provides the management structure to develop and acquire capabilities. These functions which interact throughout the acquisition process operate as a system of systems and are referred to as the "Big A" acquisition process shown in Figure 3 (Schwartz, 2014; Kotzian, 2012, p. 45).

Figure 3 Interrelationship of the DAS

Interrelationships of the DAS

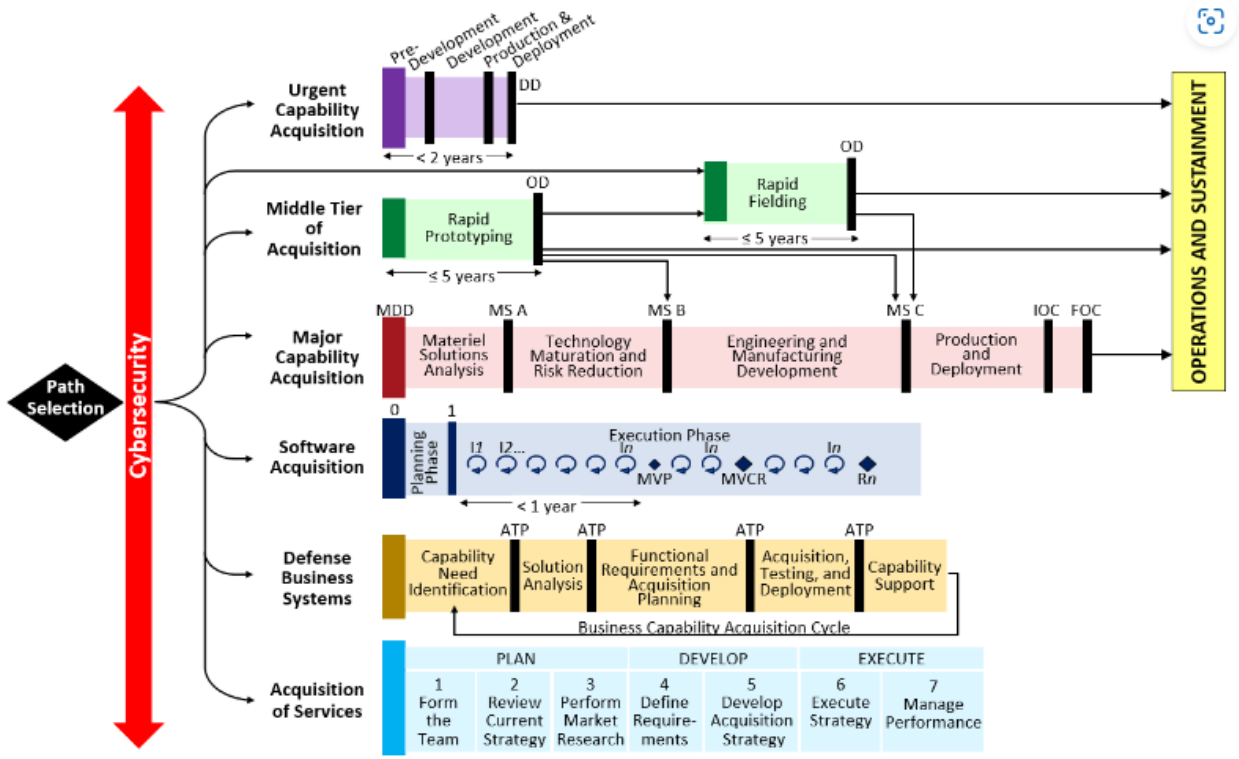


Note: Figure sourced from Moshe Shwartz (2013). *Defense Acquisitions: How DoD Acquires Weapon Systems*. Congressional Research Service. *https://defenseinnovationmarketplace.dtic.mil/wp-content/uploads/2018/02/RL340261.pdf*

The DoD now employs the Adaptive Acquisition Framework (AAF) as part of the DAS, to apply more flexibility in acquiring diverse types of materiel solutions. According to the DODI 5000.02, "The AAF supports the DAS with the objective of delivering effective, suitable, survivable, sustainable, and affordable solutions to the end user in a timely manner" (Department of Defense, 2022c, p.4.). Figure 4 below depicts the AAF with its multiple pathways available to PMs for delivering capabilities to the DoD.

Figure 4 The Adaptive Acquisition Framework

The Adaptive Acquisition Framework



Note: Image sourced from https://aaf/dau/edu/

The MTA pathway, one of six pathways within the AAF, is explained in further detail later in the literature review. The next section provides a brief history of acquisition reform prior to creation of MTA authority to address why MTA authority was conceived and implemented.

History of Acquisition Reform

The Conception of MTA Authority

COL Charles Allen (USA) and Col Peter Eide (USAF) wrote in their January 2012 Acquisition Reform Journal article titled *The More Things Change, Acquisition Reform Remains the Same* that "For over 60 years" the DOD "has attempted to fix its weapon system procurement without success" (p. 99). Allen and Eide go on to say, "'Acquisition Reform' efforts have not

consistently yielded a process/system that delivers products faster, better, or cheaper" (2012, p. 99). The need to reform DoD's acquisition processes is ever-present (Allen & Eide, 2012). New concepts developed for material acquisition have rarely worked smoothly upon initiation and have often required careful modification over time (Converse, 2012). In the Foreword of Elliot V. Converse' *History of Acquisition in the Department of Defense, Vol. I, Rearming for the Cold War, 1945 – 1960* (2012), Professor J. Ronald Fox asserts that defense acquisition and the management thereof improved during the post-cold war period. Improvements, Dr. Fox states further were "not without painful periods of recreating and re-experiencing" problems of the past (Fox, 2012, as cited by Converse, 2012, Foreword). The following summary of acquisition reform initiatives over the last 45 years provides a pretext to the development of the MTA.

Reforming the DoD's acquisition process has, in general, been accomplished through changes to Title 10 United States Code via section VIII of the NDAA (Gabriele, 2011). The defense department implements the statute with updates to "the Federal Acquisition Regulation, Defense Federal Acquisition Regulation Supplement, service component supplements, DoD Instructions, and individual service component instructions" (Gabriele, 2011, pg.2). Changes to U.S. code typically address specific procurement issues rather than wholesale overhaul measures (Gabrielle, 2011). However, reform efforts over the last three decades have addressed issues across the spectrum of defense acquisition. Major reform efforts and their key features include:

- 1983 – The Nunn-McCurdy Provision of the 1982 NDAA aimed at reducing cost growth (McGowin, 2018).
- 1986 – Packard Commission which created a new oversight structure in defense acquisition and rigorous prototype testing requirements prior to production, resulting in increased use of commercial off-the-shelf products (McGowin, 2018).

- 1990 - The Defense Acquisition Workforce Improvement Act (DAWIA) to improve the quality of the acquisition workforce (Allen & Eide, 2012).
- 1994 - The Federal Acquisition Streamlining Act which expanded the definition of 'commercial product' (Allen & Eide, 2012).
- 1994 - The 'Perry Memo' (from Secretary of Defense William Perry) that directed the DoD to use commercial specifications and standards and introduced Advanced Concept Technology Demonstrations using prototypes to reduce risk and increase military utility (Allen & Eide, 2012).
- 1996 - The Clinger-Cohen Act eliminating cost accounting standards to encourage companies to do more business with the federal government (Allen & Eide, 2012).
- 1997 - Secretary of Defense William Cohen's Defense Reform Initiative to increase competition between military capability providers (Allen & Eide, 2012).
- 2000 - Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]) Jacques Gansler's reform to reduce weapon system development and delivery cycle times (Allen & Eide, 2012).
- 2003 - Secretary of Defense Donald Rumsfeld's reform seeking innovation from non-traditional sources (Allen & Eide, 2012).
- 2005 - Acting Deputy Secretary of Defense Gordon England's Defense Acquisition Performance Assessment (DAPA) to comprehensively assess acquisition in its entirety (Allen & Eide, 2012).
- 2009 - Secretary of Defense Robert Gates' encouragement to DoD senior leaders to cancel failing programs early and limit schedule overruns (Allen & Eide, 2012).

- 2009 – Weapon Systems Acquisition Reform Act (WSARA) which was designed to increase the success of acquisition programs by focusing on key decisions early in the program through technology maturity reviews (Gabrielle, 2011; McGowin, 2018).
- 2010 – Better Buying Power 1.0 which introduced 'should cost' management to improve weapon system affordability (Carter, 2010).
- 2013 – Better Buying Power 2.0 which used affordability caps to expand 'should cost' management (Kendall, 2013).
- 2015 – Better Buying Power 3.0 which shifted acquisition emphasis to science, technology, and innovation (Kendall, 2015).

The Under Secretary of Defense, Acquisition, Technology, and Logistics (USD (AT&L)) Better Buying Power (BBP) initiatives sought to "significantly improve the DoD's management of acquisition programs" (Kendall, 2014, p. 8). BBP policy promulgated significant changes in defense acquisition while reflecting the tone of the political and economic environment. When Secretary of Defense William Gates issued his efficiency initiatives in 2010, the U.S. was deeply engaged in Counter-Insurgency (COIN) operations. China's GDP was 14% of the global GDP that year; Russia's was 4% (Center for Strategic & International Studies, 2023). The U.S. enjoyed 22% of the global GDP in 2010. Within a decade China's share of the global GDP rose to 18% while the U.S. fell dramatically to 16%. As depicted in Figure 5 below, the growth rate of U.S. investments in R&D has fallen behind China's steadily since the early 2000's.

Figure 5 Gross Domestic Product Expenditures on R&D – 1995 to 2015

Gross Domestic Product Expenditures on R&D – 1995 to 2015

Note: Chart sourced from Organization for Economic Cooperation and Development, https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm

The Budget Control Act of 2011 sequestered discretionary spending in subsequent years compelling the DoD to attack costs on all fronts. BBP was an outcome of these budgetary realities. While early BBP policy focused more on reducing the total ownership costs of defense systems than expediting schedule, Frank Kendall, then USD(AT&L) stated in his BBP 3.0 White Paper (2014), "As concerns about technological superiority mount, the priority given to shortening cycle time in general will increase" (p. 8). This evolution in thought corresponds with developments in the strategic environment between 2010 and 2015 which ultimately resulted in the creation of MTA authority.

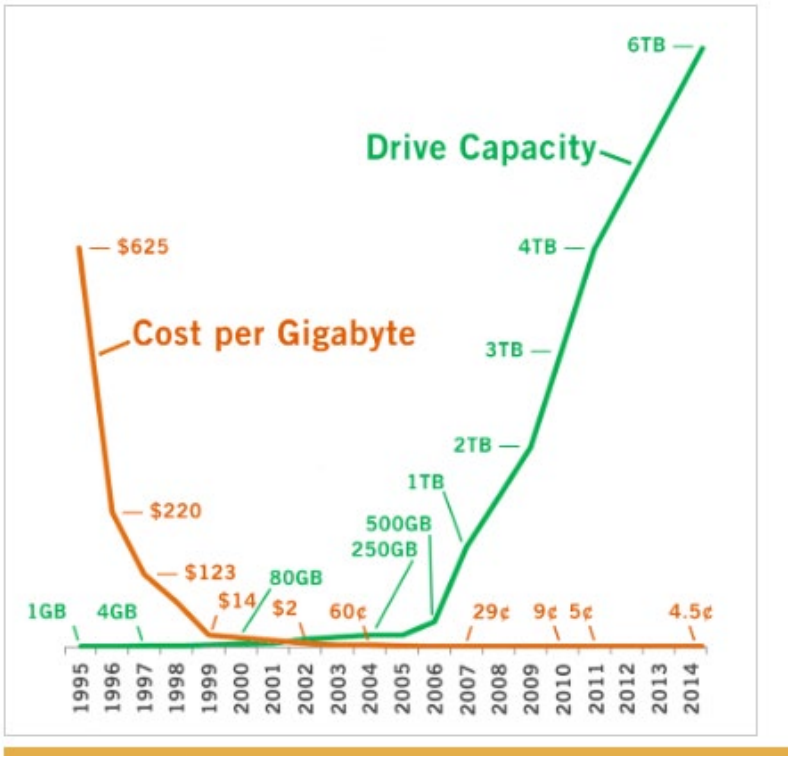
Acquisition reform efforts reflect the national security priorities and national economic conditions at the time. Predominantly, reform efforts have addressed issues with weapon system acquisition cost growth (Follet & Stark, 2014). Changes in the strategic and operational environment, however, have also precipitated acquisition reform in areas other than cost growth. The following section discusses the changes in strategic and operational environments that contributed to MTA development.

Changes in the Global Security Environment: Technological Environment

New concepts developed for material acquisition have rarely worked smoothly upon initiation and have often required careful modification over time (Fox, 2011). Whether slight or major, modifications to acquisition law, policy, and regulations attempt to maintain parity with a multitude of dynamics (Fox, 2011). Not least of which is the increasingly rapid pace of technological advancement and competitively motivated efforts in the commercial sector to drive down the cost of technologies. As internet use became widespread in the early 1990's and the popularity of home computing increased, competition among computer-based technology producers drove costs downward (Saracco, 2017). As an example, Figure 6 below depicts the precipitous decrease in the cost of computer storage and the inverse rise of computer drive capacity.

Figure 6 Hard Drive Cost and Capacity Trends

Hard Drive Cost and Capacity Trends



Note: Image sourced from Ray Bernard Consulting Services, *Advancing the Mission of* Security. 2023. https://www.go-rbcs.com/articles/the-increasing-pace-of-technology-advancement

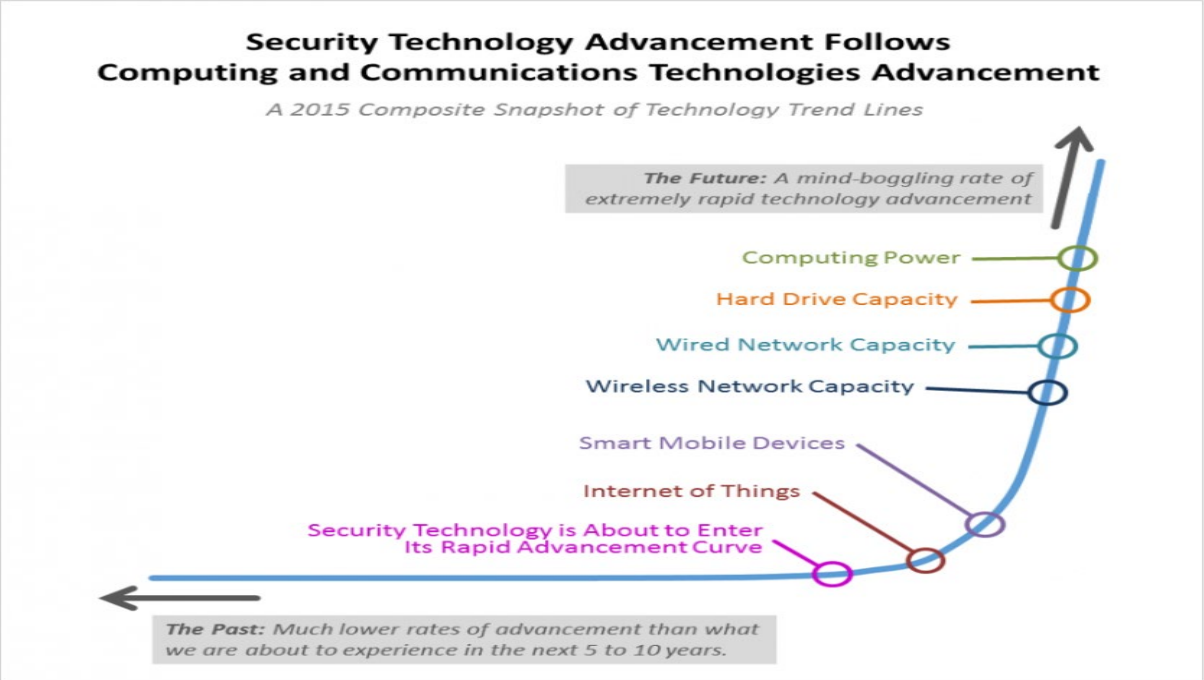
The pace of computer technology change and the rate at which threats to our national interests can leverage technological change was recognized across the national security strata. By 2018 this recognition was codified in the 2018 National Defense Strategy which states,

> The security environment is also affected by rapid technological advancements and the changing character of war. The drive to develop new technologies is relentless, expanding to more actors with lower barriers of entry, and moving at accelerating speed. Maintaining the Department's technological advantage will require changes to industry culture, investment sources, and protection across the National Security Innovation Base. (Department of Defense, 2018, p. 3)

While computing technology grew at an exponential pace (Figure 7 below), the processes and procedures the U.S. federal government used to exploit those advances struggled to keep up (Allen & Eide, 2012). Far too often, promising technology fails to ever reach the battlefield – or even the test range – because the mechanics of defense material acquisition are cumbersome or incongruous with the pace of technological advancement (McCain, 2017).

Figure 7 Exponential Rate of Technology Advancement

Exponential Rate of Technology Advancement



Note: Image sourced from Ray Bernard Consulting Services, *Advancing the Mission of* Security. 2023. https://www.go-rbcs.com/articles/the-increasing-pace-of-technology-advancement

Changes in the Global Security Environment: Strategic Environment

On September 27, 2000, GEN Henry H. Shelton, Chairman of the Joint Chiefs, testified before the Senate Armed Services Committee. GEN Shelton and his Service Chiefs were asked to assess the readiness of the Armed Forces to meet the nation's national security challenges. The focus of GEN Shelton's assessment was on the military's ability to fight and win two nearly simultaneous major theaters of conflict. The two theaters GEN Shelton was referring to, at the time of his testimony could have been anywhere, on any continent. But less than a year later, on September 11, 2001, the two major theaters of conflict strategy came to an abrupt and unceremonious end. For the decades that followed the U.S. was engaged in counterterrorism and counterinsurgency missions that obscured the rise of peer and near-peer competitors (Mazarr, 2023). Defense strategies had not pursued ideas and capabilities responsive to global peer competitors or engagements in large scale combat operations until the 2012 – 2013 timeframe (Mazarr, 2023). The DoD, having finally emerged from the aftermath of protracted conflict in Afghanistan and Iraq recognized "that the military dominance the United States has enjoyed since 1989 is vanishing and cannot be restored" (Mazarr, 2023, p. 1). Confronting this reality, Congress, and the defense establishment "rushed to make up for 20 years' worth of lost time" (Mazarr, 2023, p. 1).

Changes in the Global Security Environment: Operational Environment

In the Secretary's Letter of the 2014 Quadrennial Defense Review (QDR) Secretary of Defense Chuck Hagel wrote:

> Staying ahead of security challenges requires that we continue to innovate, not only in the technologies we develop, but in the way U.S. forces operate. Innovation – within the Department and working with other U.S. departments and agencies and

> with international partners – will be center stage as we adapt to meet future challenges. (Hagel, 2014, para. 3)

Here within Secretary Hagel's preamble to the 2014 QDR, two key concepts, innovation in how the DoD operates as a military force and innovation in technology development, paved the way for a new warfighting concept and a companion mechanism to enable that concept (Office of the Under Secretary of Defense, 2014). Innovation is often the undercurrent of defense advancement, materiel, and operations. The 2014 QDR, however, framed these concepts to precipitate a paradigm shift. Four years later, in the 2018 National Defense Strategy (NDS) the Chairman of the Joint Chiefs shifted focus away from COIN to near-peer competition. This shift became manifest in the Joint Domain and Multi-Domain Operations concepts (Perkins, 2017; Torok, 2019). The Congressional Research Service publication titled *Defense Primer: Army Multi-Domain Operations (MDO)* states that the Army developed MDO "in response to the 2018 National Defense Strategy" which "shifted the previous focus of U.S. national security from countering violent extremists worldwide to confronting revisionist powers—primarily Russia and China" (Feickert, 2021, para. 4). The 2018 NDS MDO dictates what weapon systems the Army develops and acquires, military manpower requirements, and training regimen for current and future service members (Feickert, 2021). Through the Regionally Aligned Readiness and Modernization Model (ReARMM) the Army will conduct MDO modernization dedicating "over $35 billion to modernization priorities" (Bates, 2022, para. 6). MDO sets in motion the Army's plan for a modernized Army by 2028 and multi-domain Army by 2035 (Feickert, 2021).

Achieving MDO timelines requires the Army to remain "ready to fight tonight while preparing for the future battlefield" (Bates, 2022, para. 1). The next section describes MTA

statutory authority and implementation policy to enable the Army and other DoD elements to develop an MDO force and respond to changes in global security environment.

Emergence of the MTA Pathway

In the November-December 2016 issue of Military Review, the authors of an article titled *New Business Practices for Army Acquisition* asserted that existing DoD policy such as the Department of Defense Instruction (DODI) 5000.02, Operation of the Defense Acquisition System; Army Regulation (AR) 70-1, Army Acquisition Policy; and Chairman of the Joint Chiefs of Staff Instruction 3170.01I, Joint Capabilities Integration Development System (JCIDS), possessed the characteristics of policy necessary to implement MDO (Barnes et al., 2016). However, the authors went on to state, policy guidance is "essentially undone by the Army's organizational culture" (Barnes et al., 2016, p. 61). "These organizational and cultural impediments" the authors claim, "have an inhibiting effect on positive change and reform (Barnes et al., 2016, p. 61). Under standard DAS processes, acquisition programs can take up to ten years before new weapon systems are fielded (Tate, 2021). MDO concepts mandate a more rapid defense acquisition capability. To that end, Congress in the 2016 NDAA, Section 809, provided funding to the Secretary of Defense to establish a panel of acquisition experts to conduct research and make recommendations on streamlining the defense acquisition process and regulations (NDAA of 2016, Pub. L. No. 114-92, 129 Stat. 889 (2015)). The Act further directed the 809 Panel to submit a report on its findings and recommendations within two years (Tate, 2021). Within one of the interim reports, the Section 809 Panel recommended a major acquisition reform known as portfolio management (Shultz, 2020). According to Shultz, the portfolio-based acquisition model would "…achieve faster cycle times and deliver better outcomes" (Shultz, 2020, p. 27). Another improvement of adopting the portfolio management

model would be reduced oversight from the Office of Secretary of Defense and Service Acquisition Executive as stipulated in DOD 5000.02 (Tate, 2021). Shorter acquisition cycle times and reduced oversight were necessary changes to how the DoD "buys what it needs to equip its warfighters" (Section 809 Panel, 2017, p. 2). Necessary changes because, as the Panel stated the way the DoD does acquisition is from "another era" (Section 809 Panel, 2017, p. 2). Again, according to the 2017 report, the "DoD must implement bold approaches and bold solutions to produce true reform" (Section 809 Panel, 2017, p. 2).

MTA Pathway Authorities

In 2015, the 2016 NDAA language describing the MTA passed in Congress (Lofgren, 2020). In November of that year the NDAA for Fiscal Year 2016 became Public Law 114-92. Section 804 of the law titled Middle Tier of Acquisition for Rapid Prototyping and Rapid Fielding required the USD(AT&L) to establish implementation guidance for the MTA. Responding to Section 804 of the 2016 NDAA, the USD(A&S) published interim guidance in April 2018 granting military departments the authority to implement MTA programs. This initial guidance was broad in nature and included language pertaining to MTA's purpose and the requirements of the MTA pathway (Government Accounting Office, 2023b). Within six months DoD components, the Air Force, Army, Navy, and the Special Operations Command (SOCOM) issued MTA implementation guidance providing additional refinement of roles and responsibilities. The DoD published the DODI 5000.80, *Operation of the Middle Tier of Acquisition* in December 2019 establishing formal parameters and management procedures for both MTA pathways (i.e., rapid prototyping and rapid fielding). MTA guidance provided military departments and PMs the flexibility to quickly acquire promising technologies if those technologies could be delivered faster (Department of Defense, 2023a).

The rapid prototyping pathway "shall provide for the use of innovative technologies to rapidly develop fieldable prototypes to demonstrate new capabilities and meet emerging military needs" (NDAA of 2016, Pub. L. No. 114-92, 129 Stat. 889 (2015) 2016 § 804(b)(1)). The rapid fielding pathway "shall provide for the use of proven technologies to field production quantities of new or upgraded systems with minimal development required" (NDAA of 2016, Pub. L. No. 114-92, 129 Stat. 889 (2015) § 804(b)(2)). The statute directs development of "a streamlined and coordinated requirements, budget, and acquisition process that results in the development of an approved requirement for each program in a period of not more than six months from the time that the process is initiated" (NDAA of 2016, Pub. L. No. 114-92, 129 Stat. 889 (2015) § 804(c)(1)). Programs subject to MTA policy "shall not be subject to the Joint Capabilities Integration and Development System Manual and Department of Defense Directive 5000.01, except to the extent specifically provided in the [MTA] guidance" (NDAA of 2016, Pub. L. No. 114-92, 129 Stat. 889 (2015) § 804(c)(1)). These key features distinguish the MTA pathway from the other acquisition approaches within the AAF as depicted in Figure 8 below.

Figure 8 Comparison of Acquisition Approaches

Comparison of Acquisition Approaches

	DODI 5000.02 Enclosure 13	Sec 804 FY2016 NDAA Middle Tier of Acquisition (MTA)		DODI 5000.02 Model 4
Type	Urgent Capability Acquisition	Rapid Prototyping	Rapid Fielding	Accelerated Acquisition
Technology	-	Innovative	Proven	-
Requirement	Validated UON	Exempt from JCIDS	Exempt from JCIDS	JCIDS
Timeline	Field ≤ 2 years	Field prototype ≤ 5 years	Start production ≤ 6 months; Complete fielding ≤ 5 years	None
Other	Below ACAT I and IA	Exempt from DODI 5000; PM reports to SAE	Exempt from DODI 5000; PM reports to SAE	Statutory requirements for MDAPs

Note: Figure sourced from Hyatt, 2019. *Rapid Acquisition – The Challenge to Accelerate.* Defense Acquisition University. Available at https://www.ndia.org/-/media/sites/ndia/divisions/ipmd/2019-04-meeting/207-middle-tier-of-acquisition-lacamera-190508215620.pdf

Section 804 occupies roughly two pages in the 2016 NDAA, expressed concisely in 1,088 words. Military departments initiated the first MTA programs shortly after the ASD(AT&L) issued implementation guidance in 2018. In June 2018 Ben Fitzgerald (then Director of Acquisition and Sustainment Strategy in the Office of the Assistant Secretary of Defense (Acquisition) met with Dr. William Roper, Assistant Secretary of the Air Force (Acquisition, Technology & Logistics) and Dr. Bruce Jette, Assistant Secretary of the Army (Acquisition, Logistics, and Technology) to discuss their thoughts on Section 804 authorities, applications, and attributes. Some of the key statements during that discussion illustrate features of the MTA pathway that distinguish it from traditional acquisitions under the DODD 5000.01

The Defense Acquisition System and DODI 5000.02 Operation of the Defense Acquisition System. At the time of the interview the AAF had not yet been created (Mortlock, Defense Acquisition University, 2023).

Dr. Jette, citing his experience in the commercial sector, stated that Section 804 will enable the Army to "find the quickest path to failure" (Jette, 2018a). That is, rapid prototyping will allow PMs to find what can be done and what is still technologically impossible or cost prohibitive, sooner than proceeding through the traditional milestone sequence. Dr. Roper stated that the time limits of Section 804 force PMs to tackle highest technical risks earlier in a program timeline (Roper, 2018). Failing faster through rapid prototyping allows PMs to "learn by doing" in a risk pursuing environment. This, as both Dr. Jette and Dr. Roper noted, contrasts with the risk averse culture of the milestone acquisition approach. Dr. Roper also noted the fundamental shift precipitated by Section 804 from a serial document process (i.e., JCIDS requirements first, development and acquisition of a material solution second) to more concurrent requirement – experiment – approach (S, Shepherd, personal communication, November 1, 2023).

MTA Policy

Prior to 2017, DoD guidance for acquisition provided for four basic models to "serve as examples of defense program structures tailored to the type of product being acquired or to the need for accelerated acquisition" (Department of Defense, 2015, p. 8). Model 1, the Hardware Intensive Program model was the "classic model" provided in previous versions of acquisition guidance (Department of Defense, 2015, p. 9). The second and third models described processes for acquiring software (Department of Defense, 2015). The fourth model, the Accelerated Acquisition Program model "when schedule considerations dominate over cost and technical risk considerations" (Department of Defense, 2015, p. 13). Model 4 "compresses or eliminates phases

of the process and accepts the potential for inefficiencies in order to achieve a deployed capability on a compressed schedule" (Department of Defense, 2015, p. 13). All the models in the 2015 release of the DODI 5000.02 required program decision and milestone reviews. As provided in the 2015 DODI 5000.02:

> The purpose of the decision reviews embedded in the acquisition procedures described in this section is to carefully assess a program's readiness to proceed to the next acquisition phase and to make a sound investment decision committing the Department's financial resources. (p.3)

The 2015 version of the DODI 5000.02 was extensive, including 154 pages of details and 13 enclosures; the last, Enclosure 13 provided the policy and procedures to rapidly field capabilities (Department of Defense, 2015). Based on urgent operational needs and reflected in the JCIDS Joint Urgent Operational Needs and Joint Emergent Operational Needs, Enclosure 13 of the 2015 DODI 5000.02 became the DODI 5000.81. The Assistant Secretary of Defense for Acquisition published the DODI 5000.02T, Operation of the Defense Acquisition System as interim guidance while individual 5000 series were published. The early versions and subsequent reissuances provided updates to acquisition policy and procedures that were eventually codified in separate instructions. In January 2020, the DoD adopted the Adaptive Acquisition Framework formally issuing implementation guidance for all acquisition pathways. The USD(A&S) issued the DODI 5000.02, Operation of the Adaptive Acquisition Framework, establishing "the purpose and key characteristics of" …" acquisition pathways" (Department of Defense, 2020a, p.1). This transformative policy provided a set of flexible acquisition pathways which would empower PMs, provide tailoring options, speed the acquisition process, and meet the spectrum of needs, from immediate to distant future (Reil, 2020). The AAF formally described two major pathways

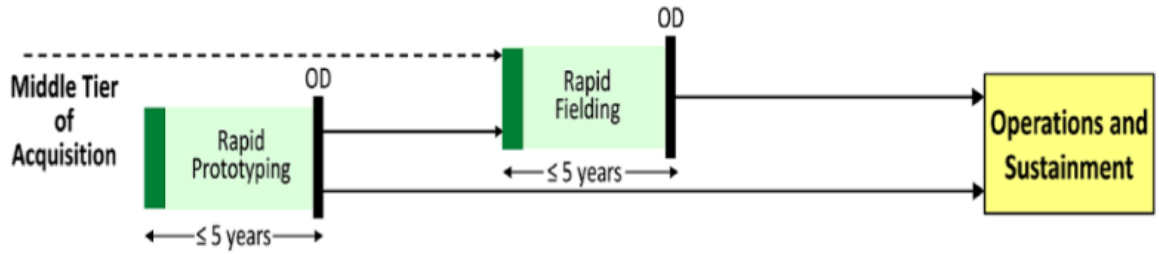
to acquire new capabilities in addition to the MTA which had been implemented two tears prior. The Major Capabilities Acquisition (MCA) and the Urgent Capability Acquisition (UCA) pathway. The MCA pathway provides a process for obtaining complex and enduring systems (Department of Defense, 2022c). The goal of the UCA pathway is to "field capabilities to fulfill urgent existing or emerging operational needs or quick reactions in less than 2 years" (Department of Defense, 2022c, p. 12). Section 804 of the 2016 NDAA which created the authority for the Middle Tier of Acquisition in 2016 bridged the gap between MCA and UCA. While UCAs require fully matured technology and MCAs develop technology over a lengthy period, MTA programs are supposed to develop innovative, fieldable technologies that will result in a residual or fieldable operational capability within five years (Department of Defense, 2022c).

The DODI 5000.80, which became effective December 30, 2019, establishes policy, responsibilities, and provides procedures for the management of MTA programs (Department of Defense, 2019b). The MTA has two distinct pathways, one for rapid prototyping and one for rapid fielding. As stated in the DODI 5000.80, (2019b) the MTA "is intended to fill a gap in the DAS for those capabilities that have a level of maturity to allow them to be rapidly prototyped within an acquisition program or fielded, within 5 years of MTA program start" (p.3). While both pathways of the MTA limits programs to a five-year window from initiation through completion (unless waived by the Defense Acquisition Executive), rapid fielding further constrains programs to begin production within six months of program start. The requirement to begin production within six months compelled PMs to leverage more mature technologies. At the end of the five-year window, PMs executing either MTA pathway must submit an outcome determination to the applicable decision authority (i.e., the Component Acquisition Authority or

Program Executive Officer, if delegated). The outcome determination is a detailed description of what was achieved during the MTA program, what was not achieved, and the next steps for the prototype technology (e.g. transition or termination). Figure 9 depicts a generalized view of both MTA pathways.

Figure 9 The Middle Tier of Acquisition Pathway

The Middle Tier of Acquisition Pathway



Note: Image sourced from Middle Tier of Acquisition (MTA) | Adaptive Acquisition Framework | *Defense Acquisition University* | https://aaf.dau.edu/aaf/mta/

There are several other unique and distinguishing characteristics of each MTA pathway. Descriptions of each pathway are provided below to highlight those characteristics.

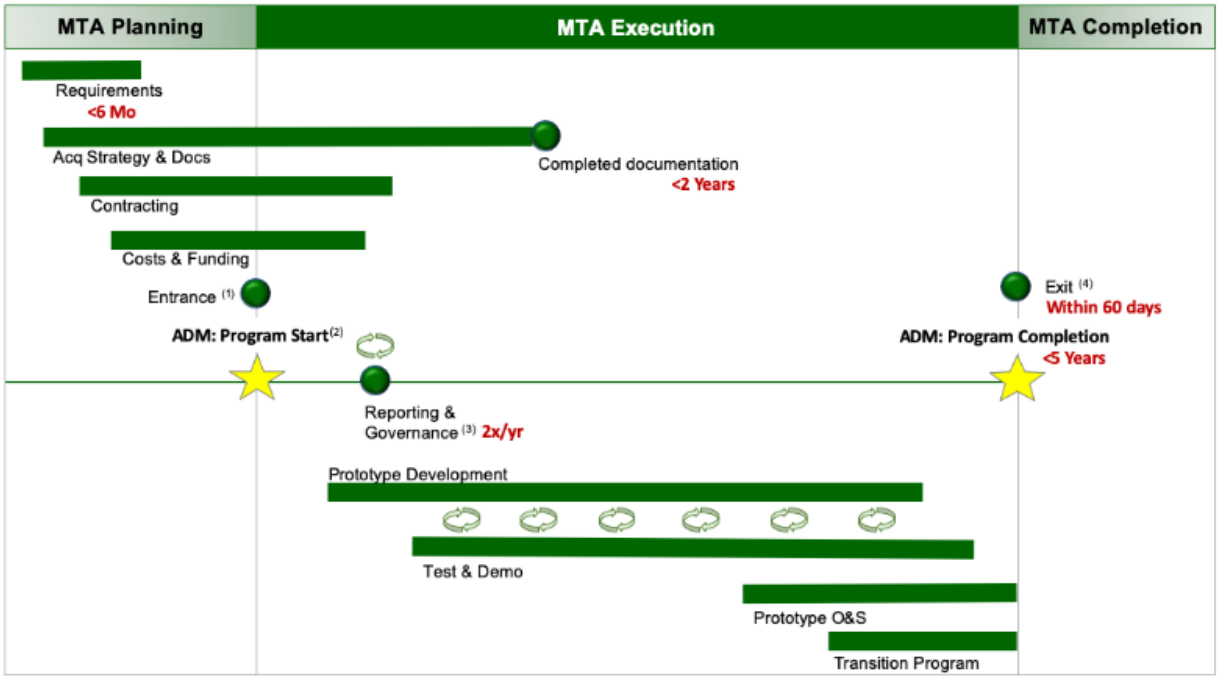
Rapid Prototyping

Rapid prototyping programs develop innovative, fieldable technologies that can be, 1) "demonstrated in an operational environment", and 2) "provide for a residual operational capability within 5 years of the MTA program start date" (Department of Defense, 2019b, p. 3). An operational environment, as defined in the DODI 5000.80 (2019b) is "a set of operational conditions, selected by the users in coordination with the appropriate independent operational testing agency that are representative of the desired spectrum of operational employments" (p. 14). The DoD Technology Readiness Assessment Guidebook states that Technology Readiness Level 7 "results from testing a prototype system in an operational environment" (2023b, p. 6).

The DODI 5000.80 (2019b) defines residual operational capability as any fieldable capability that is useful to or has operational utility for a military user (p. 14). Figure 10 below depicts a lifecycle view of the MTA rapid prototyping pathway. The figure shows the MTA rapid prototyping major events and relative duration of those events.

Figure 10 Lifecycle View of Rapid Prototyping

Lifecycle View of Rapid Prototyping



Note: Image sourced from Middle Tier of Acquisition (MTA) | Adaptive Acquisition Framework | *Defense Acquisition University* | https://aaf.dau.edu/aaf/mta/

According to the DODI 5000.80, MTA rapid prototyping programs culminate with an outcome determination Acquisition Decision Memorandum (ADM) signed by the applicable Decision Authority (Department of Defense, 2019b). This document states one of the following:

1) The program has transitioned to an existing acquisition program.
2) The program has transitioned to a new acquisition program.

3) The program has transitioned to a different acquisition pathway.
4) The program has produced a sustained residual operational capability.
5) The program has transitioned to rapid fielding.
6) The program has terminated.

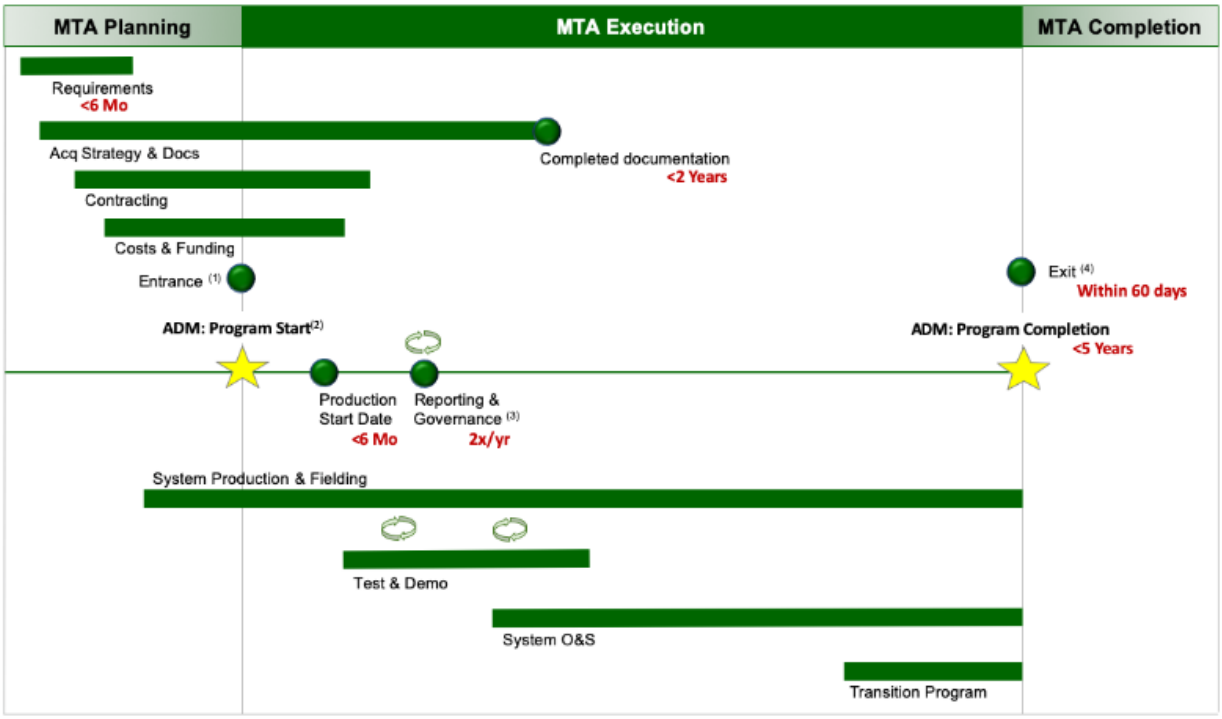
(Department of Defense, 2019b, p.13)

Rapid Fielding

Programs using the rapid fielding pathway leverage "proven technologies to field new or upgraded systems" within five years (Department of Defense, 2019b, p. 3). Beginning production within six months of the program's start date is an objective of the rapid fielding pathway rather than a requirement (Department of Defense, 2019b). The DODI 5000.80 does not define 'proven technologies'; however, the DoD Technology Readiness Assessment Guidebook (2023b) defines TRL 8 as "technology [that] has been proven to work in its final form and under final configuration under the expected conditions" (p. 6). One can infer therefore that, because of the requirement to begin production within six months of program start date the product or technology developed or acquired under the rapid fielding pathway, was assessed at a minimum of TRL 7, provided that TRL 8 can be achieved in the first six months of the program. MTA rapid fielding programs also culminate with an outcome determination ADM stating the program has achieved the Decision Authority's minimum fielding plan criteria (Department of Defense, 2019b). Figure 11 below depicts a lifecycle view of the MTA rapid fielding pathway. As depicted in the figure, the MTA rapid fielding pathway requires commencement of production within six months of the program start date.

Figure 11 Lifecycle View of Rapid Fielding

Lifecycle View of Rapid Fielding



Note: Image sourced from Middle Tier of Acquisition (MTA) | Adaptive Acquisition Framework | *Defense Acquisition University* | https://aaf.dau.edu/aaf/mta/

Acquisition PMs can use the MTA pathway to accelerate capability maturation through rapid prototyping or minimally develop a capability that can be rapidly fielded (Department of Defense, 2020a). In addition to the different objectives of the rapid prototyping and rapid fielding pathways, each has its own unique set of programmatic characteristics. For example, rapid fielding programs require product support strategies codified in a Life Cycle Sustainment Plan while rapid prototyping programs do not. Table 1 highlights the major differences between the MTA's rapid prototyping and rapid fielding pathways. The distinct features of each MTA pathway offer PMs flexibility in their acquisition approach.

Table 1 Differing Characteristics of Each MTA Pathway

Differing Characteristics of Each MTA Pathway

	Rapid Prototyping Pathway	Rapid Fielding Pathway
Program Focus	Use Innovative Technologies to Demonstrate New Capabilities	Field Production Quantities of New or Upgrades Systems
Objective	Field Prototypes Meeting Defined Requirements Providing a Residual Operational Capability w/in Five Years	Begin Production within Six Months and Complete Fielding w/in Five Years
Operational Needs	Innovative Technologies New Capabilities	Existing Products Proven Technologies
Operational Demonstration	Assess / Validate Performance in an Operational Environment	Support Initial Production Decision
Lifecycle Sustainment Plan	No	Yes
Acquisition Strategy	Technical Risks	Production Risks
Testing	Measure Technology Maturity	Measure Mission Contributions, Ability to Fulfill CONOPS

Note: Image sourced from Middle Tier of Acquisition (MTA) | Adaptive Acquisition Framework | *Defense Acquisition University* | https://aaf.dau.edu/aaf/mta/

MTA Exemptions – Increasing the Speed of Acquisition

JCIDS

The significance of changes to defense acquisition precipitated by Section 804 of the 2016 NDAA is manifest perhaps most significantly in MTA's exemption from the JCIDS process. The "JCIDS is the process by which the military develops and validates capability requirements for joint (more than one Service) use and interoperability" (Anton et al., 2022, p. 5). Prior to JCIDS, each branch of the armed services identified its own capability gaps and then developed requirements to fill those gaps (Stark, 2023). In 2003, then-Secretary of Defense the Honorable Donald Rumsfeld established the JCIDS to make this process more unified and

coordinated. Original JCIDS documentation was 83 pages. By 2022 it had grown to 396 pages (Anton et al., 2022). The Acquisition Innovation Research Center *Report on Joint Capabilities Integration and Development System* assessed that the 2022 "current JCIDS process for preparing and validating an Initial Capabilities Document (ICD) followed by a Capabilities Development Document (CDD) was an average of 852 days" (Anton et al., 2022, p. 3). Under MTA authorities, "[Army] programs can swap the 45-page CDD for a ten page Abbreviated-CDD (A-CDD)" (Stark, 2023, The Mighty SORRD section, para. 2) significantly reducing time for requirements development and validation.

A validated set of requirements is still necessary under MTA authority. The DODI 5000.80 (2019b) states that each "DoD Component will develop a streamlined process that results in a succinct requirement document no later than 6 months from the time the operational needs process is initiated" (p.4). The A-CDD is an Army-only requirements document "designed to rapidly provide prototypes for templated or suggested desired characteristics in order to quantify desired characteristics, validate the technology and scope the future thresholds and objectives to evolve into a mature requirement through this active process" (Department of the Army, 2021, p.25). The A-CDD specifically supports MTAs, but these are not the only form of requirements document available to MTA PMs. MTAs can use other validated requirements in an ICD or CDD. While an A-CDD covers the same topics found in a CDD the specific details are expected to be learned through rapid prototyping (Department of the Army, 2021). Additionally, there is no policy or regulatory requirement for A-CDDs to receive joint review or validation by the Joint Requirements Oversight Council. If the outcome of an MTA results in a decision to pursue an MCA the A-CDD will be converted to a CDD with all requisite details and staffing requirements (Department of the Army, 2021, p.26). A-CDDs contain desired

characteristics instead of requirements. These desired characteristics define “a possible threshold that provides military utility” (Department of the Army, 2021, p.26).

Technology Readiness Assessment

The MTA increased acquisition velocity by allowing the DoD to tailor certain steps in the materiel development process. One of the more noteworthy steps involves the Technology Readiness Assessment (TRA). According to the DoD Technology Readiness Assessment Guidebook (2023b), the TRA “is an evaluation to determine whether a technology is mature enough to include in a larger system” (p. viii). The TRA indicates the maturity level, or Technology Readiness Level, of technology. TRL is a score measuring the “amount of development completed, prototyping, and testing within a range of environments from lab . . . to operationally relevant" (MITRE Corps, 2014, p. 511). Title 10 USC 4252 requires a TRA for Major Defense Acquisition Programs (MDAP) before a Milestone B decision. According to MTA policy, there is no requirement to conduct a TRA prior to or during an MTA program (Department of Defense, 2019b). MTA programs were intended to balance risks of not conducting TRAs or delaying them by leveraging technologies of a certain level of maturity (Government Accounting Office, 2020a).

Review of MTA Implementation and MTA Programs

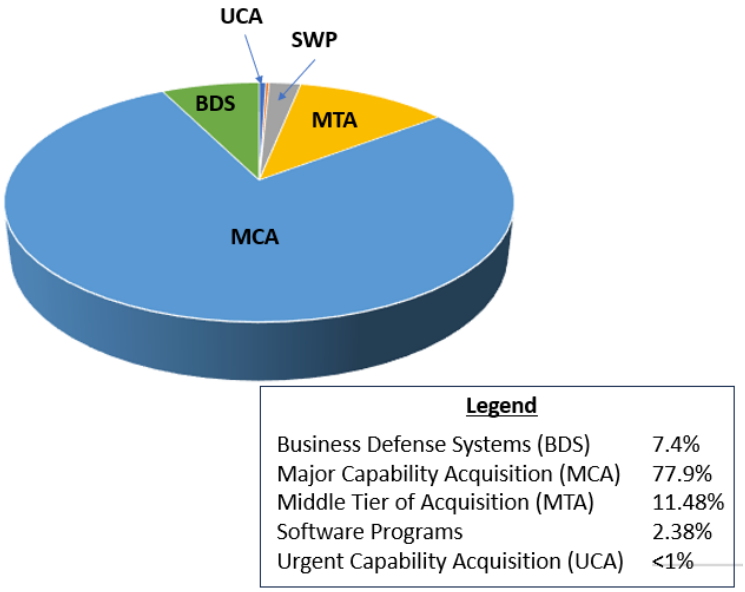
As of October 2023, MTA programs represented roughly 12% of the total number of active programs in the DoD acquisition portfolio. The majority of the DOD’s acquisition program portfolio, by count of programs and total investment, are acquisition programs that use the MCA pathway (DAVE, accessed December 22, 2023; Department of Defense, 2022b). Figure 12 depicts the quantity of each acquisition program type and pathway by percentage of

the total DoD acquisition portfolio*. The significance of this data is that even five years after MTA guidance was issued most defense acquisition programs still follow the MCA pathway.

**Note: Data reflects only those programs annotated in the DAVE. The DAVE dataset does not include Rapid Capabilities and Critical Technologies Office programs or Directed Requirements efforts.*

Figure 12 Percentage of Defense Acquisition Programs by Type / Pathway

Percentage of Defense Acquisition Programs by Type / Pathway



Note: Figure sourced from the Digital Acquisition Virtual Environment | as of 23 October 2023 | https://dave.acq.osd.mil/programs

The U.S. Special Operations Command (SOCOM) manages one third of the total number of active MTA programs. Distribution of the remaining two-thirds is shared by the Air Force (22%), Army (20%), and Navy (18%). Considering that MTA authority was available to the military departments beginning in 2018 is not surprising that 135 of the 203 MTA programs annotated in the DAVE are listed as 'active' (DAVE, accessed October 23, 2023). Table 2 below provides MTA program usage by DoD component.

Table 2 Middle Tier of Acquisition Program Information

Middle Tier Acquisition Program Information

	MDAP/ACAT Equivalent		MTA				
	Yes	No	Rapid Prototyping	Rapid Fielding	Major System	# of MTA's	% of Total MTA Pgms
USAF	6	24	19	11	8	30	22%
Army	6	21	21	6	10	27	20%
USN	1	23	21	3	4	24	18%
SDA	0	2	2	0	0	2	1%
USSF	8	0	8	0	8	8	6%
SOCOM	0	44	4	40	0	44	33%
TOTAL	21	114	75	60	30	135	

Note: Table sourced from the Digital Acquisition Virtual Environment | as of 23 October 2023 | https://dave.acq.osd.mil/programs

Between March 2022 and October 2023, the U.S. Air Force increased the number of MTA rapid prototyping programs from 19 to 30. Between August and October 2023, the U.S. Special Operations Command increased the number of MTA rapid fielding programs from 35 to 40. While most MTA programs are small or medium sized in terms of investment dollars, many have made important contributions to large programs such as upgrades to the B-52 and F-22 aircraft, hypersonic missile programs, and satellite communications programs (MacGregor et al., 2022). The DoD has employed MTA authority in pursuit of an array of new capabilities and system upgrades. The following are reviews of MTA programs from the perspectives of advocates, detractors, and independent third-party entities. These summaries provide the reader insight into how the MTA is being employed across the DoD and perspectives on MTA benefits and issues.

USAF – B52 Commercial Engine Replacement Program (CERP)

The B-52 CERP is an MTA rapid prototyping program that integrates eight new Rolls-Royce F130 jet engines onto each B-52 aircraft platform. The F130 replaces the original TF33 engine that has equipped B-52H's since 1962 (Tirpak, 2022). Acquisition of the new engine is part of a larger effort to re-engineer the Stratofortress bomber fleet to the end of the system's lifetime (Tirpak, 2022). Rapid prototyping the Rolls-Royce commercial jet engine allows the USAF to apply only those modifications required for Air Force specifications. The B-52 CERP MTA program culminates in a transition to a 'traditional' program at MS B (Tirpak, 2022). The MTA rapid prototyping program created a digital twin of the new engine allowing the Air Force, Rolls-Royce, and system integrator Boeing to test the design identifying problems before engines were physically built (Losey, 2023). Use of these digital prototype models allowed the Air Force to reduce risk in advance of engine selection. According to Air Force officials, conducting the B-52 CERP using MTA rapid prototyping allows the Air Force to have more options than just modernizing the B-52. While developing new engine prototypes the Air Force can also pursue a 'clean-sheet' bomber to replace the B-52 leveraging what was learned from the prototyping effort. Should the upgraded bombers or replacement aircraft using the new engines not achieve requirements, the Air Force can use MTA program outcomes to update weapons rather than airframes (Losey, 2023). Thus, the CERP rapid prototyping program provides strategic flexibility across Air Force programs and missions not previously available under traditional acquisitions (Losey, 2023).

Despite these advantages the program has experienced challenges. In 2022 during Congressional testimony on service modernization, Air Force acquisition executive The Honorable Andrew P. Hunter addressed a question by panel member Representative Rob

Wittman (R-VA) regarding B-52 CERP cost growth. At the time of the testimony program costs had increased by 50 percent over a government estimate completed in 2017 (Tirpak, 2022). The jump in costs concerned some in Congress of potential Nunn-McCurdy breach. The Nunn-McCurdy law of 1982 states that if program costs increase 25 percent over current baseline, or 50 percent over original estimates, it must be canceled. Air Force officials claim that the reports of cost growth are inaccurate (Tirpak, 2023). Because the CERP program was an MTA, it won't have a program baseline until MS B. The Air Force plans to transition the CERP to an MCA at MS B. According to Air Force materiel lead COL Louis Ruscetta the B-52 CERP was not fully funded early on. Transitioning to an MCA requires the Air Force to establish a new cost baseline and certify full program funding (Tirpak, 2023). Since the B-52 CERP MTA program provides actual costs from activities such as integration testing the new cost baseline, the Air Force claims, will be more accurate (Tirpak, 2023).

USAF – Three-Dimensional Expeditionary Long-Range Radar (3DELRR)

The 3DELRR is a ground-based sensor developed by the Air Force to detect, identify, track, and report aerial targets. The system is being developed to replace the Air Force's legacy AN/TPS-75 radar by 2029. The 3DELRR program began as an MDAP in 2009, entered the engineering and manufacturing development phase in 2017, and underwent re-baselining in 2019 due to technical and supplier challenges (Department of Defense, 2023a). The program transitioned to an MTA rapid prototyping program in December 2019 and transitioned again to the rapid fielding pathway in April 2022 (Department of Defense, 2023a). In April 2022, the Air Force awarded defense contractor Lockheed Martin a production contract for two of the required 35 systems. The Air Force intended to use an MTA rapid prototyping pathway to develop 3DELRR prototypes and produce Low-Rate Initial Production systems. Following successful

rapid prototyping the Air Force planned to transition to a rapid fielding program to complete production of the remaining 35 systems. Low-Rate Initial Production is a production of a system to provide representative articles for operational test and to establish an initial production base permitting an orderly increase in the production rate. The term Low-Rate Initial Production, however, is not used within the MTA paths (Department of Defense, 2023a).

The original acquisition strategy would have allowed the Air Force to meet the 2029 objective. However, when technical delays during prototyping threatened to extend the program an additional three years the PM proposed moving ahead to a new MTA rapid fielding program. In April 2022, Air Force PEO Digital approved the move and the 3DELRR program was subsequently designated as an MTA rapid fielding program.

According to an August 2023 DODIG report on the Air Force's use of MTA for the 3DELRR, the Air Force failed to comply with the DODI 5000.80. Specifically, the Air Force never completed rapid prototyping exit criteria prior to transitioning to the rapid fielding pathway (Department of Defense, 2023a). The 3DELRR prototypes did meet the first exit criteria by demonstrating the ability to communicate with other Air Force Command and Control (C2) systems. However, due to what was determined by the DODIG to be misinterpretation of funding guidance, the Air Force transitioned to the rapid production pathway three years early.

Air Force officials and the Assistant Secretary of the Air Force for Financial Management and Comptroller advised the 3DELRR program office that procurement funding could not be used to acquire prototypes in the rapid prototyping program. DoD financial management regulations however, "authorize the use of procurement funding to purchase the initial production units in the rapid prototyping path" (Department of Defense, 2008, p. 1-39). Air Force officials claim that decisions to close out rapid prototyping early was due to lack of

clarity in statute and policy. Neither Title 10 USC nor DODI 5000.80 proscribe a particular type of funding for MTA programs (Department of Defense, 2023a). The DODIG report states that "in the absence of specific guidance, future programs could face similar situations that could affect the DoD's ability to use the MTA pathways to field capabilities quickly" (Department of Defense, 2023a, p. 14).

The DODIG report asserts that when the 3DELRR program office determined that it would not achieve the MTA rapid fielding acquisition strategy (i.e., complete production of the 35 systems within five years of the rapid fielding program start date) the PM developed, and the Air Force Acquisition Executive approved a new strategy to complete production during a follow-on MCA. This action was determined to be in violation of the DODI 5000.80 because the rapid fielding program had not achieved its acquisition strategy. DoD Instruction 5000.80 allows the Defense Acquisition Executive to waive the MTA five-year limit if deemed necessary (Department of Defense, 2019b). According to the DODIG, the 3DELRR PM should have requested a waiver to extend the rapid prototyping program rather than restructuring the acquisition approach.

Army - PEO C3T

In May 2019, following Army Acquisition Executive (AAE) authorization to use the MTA pathway, PEO Command, Control and Communications – Tactical (PEO C3T) inducted two of their most critical programs into the MTA pathway. Both the Integrated Tactical Network (ITN) and Unified Network Operations (UNO) efforts were designated by the AAE as rapid prototyping MTA programs. Designation as MTA programs allowed PEO C3T to tailor the acquisition process in a manner that was "appropriate to the capability's maturity and mission needs" (Burbey et al., 2019, para. 8). This tailored acquisition process enables capability fielding

in two to five years versus the seven to 12 years typically experienced with the traditional acquisition process. Tailoring, under MTA rapid prototyping guidance allowed for concise and simplified program documentation. “For PEO C3T, the familiar 200-page acquisition strategy is now a 17-page acquisition plan” (Burbey et al., 2019, para. 8). Additionally, MTA authorities provide PM’s maneuver room within which they can revise capability requirements and ease the process for requirements revalidation. Both requirements revision and revalidation are allowable with rapid prototyping and/or rapid fielding (Burbey et al., 2019).

Because MTA eliminates the requirement of formal, JCIDS-approved requirements PMs are free to initiate prototyping with a minimal set of objectives (Burbey et al., 2019). The basic objectives can be refined iteratively ensuring they meet Soldier’s needs (Burbey et al., 2019). The ITN injects newly developed commercial products and network transport capabilities, reducing size and weight of components while constantly increasing speed and network flexibility. Integrating the separately developed commercial components is “easily managed with the middle-tier acquisition process” (Burbey et al., 2019, Integrated Tactical Network section, para, 1). With the MTA pathways, the maturity and proven capabilities of each component can determine if prototypes are rapidly fielded under a different MTA program or integrated into an existing acquisition program. Conversely, under the MTA pathway if a prototype does not achieve performance requirements, PMs can cancel that specific prototyping effort to conserve program funding and resources.

According to PEO C3T, the UNO effort is benefitting from its MTA designation in other ways as well. As a system that integrates communications and connectivity across echelons, the UNO would require a unified requirements document representing the requirements of a host of stakeholders. Simply developing a unified set of JCIDS-approved requirements would

potentially delay program initiation under other acquisition pathways. However, as deputy PEO for C3T Joe Welch states, “with MTA, we can move forward as a rapid prototype … [by] just receiving a memo out of the Cyber Center of Excellence" (Burbey et al., 2019, Unified Network Operations section, para. 3). PEO C3T’s use of MTA exempts the ITN and UNO from the formal JCIDS process allowing them to develop and refine requirements through direct interaction with the user while capabilities are being developed.

PEO C3T is expected to transition mature technologies to rapid fielding and other, existing programs throughout the MTA rapid prototyping five-year timeline (Burbey et al., 2019). From its first use of MTA authorities PEO C3T captured three key takeaways:

- Starting a program based on basic objectives speeds program initiation.
- The MTA allows use of advanced commercial technologies which speeds modernization.
- MTA’s simplified documentation requires less staffing.

Army - Extended Range Cannon Artillery (ERCA)

In 2015, the Army launched a science and technology program to greatly extend artillery strike range and precision otherwise known as Extended Range Cannon Artillery or ERCA. In 2019 long range precision fires became a priority within the Army Modernization Strategy making ERCA a priority capability. “The combination of evolving technology, more robust funding and priority status set the stage for the ongoing assembly of ERCA systems, known officially as mid-tier acquisition prototypes” (Lopez, 2022, para. 11).

The Picatinny Arsenal’s Armament Center used MTA authority to assemble many ERCA prototypes, a paradigm shift from its typical role in research and development. Where typically the Armament Center matures technology for an Army customer which accepts transfer of the

development project, with ERCA prototyping the U.S Army Combat Capabilities Development Command (DEVCOM) organization is moving at an unprecedented pace (Lopez, 2022). MTA rapid prototyping flexibilities have allowed the Armament Center to "[save] valuable time, solving problems quickly and avoiding overreliance on outside contractors during the testing and assembly stage" (Lopez, 2022, para. 21). The "integrated, simultaneous, and concurrent approach is what speeds up our development" (Troll as cited in Lopez, 2022, para. 23).

The ERCA's MTA program that started in 2018 was planned to transition to an MCA at the five-year point, entering the major capability pathway at Milestone C (MS C), beginning production and deployment. Rapid prototyping was planned for completion in October 2023. The program experienced technical issues during live fire testing. Characterizing the challenges required design changes and additional testing. The delays would have extended the program to beyond the MTA five-year limit. Additionally, the additional testing and schedule delays increased program costs by 10 percent (Government Accounting Office, 2023a). When the Army requested an extension to address the technical shortfalls the USD(A&S) denied the request. According to the GAO, the challenges during live fire testing would have been identified earlier had the program conducted formal technology risk assessments earlier in development (Government Accounting Office, 2023a). Independent cost estimates, the GAO further claims, would have "helped decision makers identify whether the program was well positioned to deliver the planned capability within 5 years" (Government Accounting Office, 2023a, p. 163). Instead of stopping the program, the Army plans to complete actions necessary to transition the program to the MCA pathway with transition planned for late FY24.

Army - Mobile Protected Firepower (MPF)

On 17 December 2018 the Army selected two contractors for the development of Mobile Protected Firepower (MPF) prototypes under two MTA rapid prototyping programs. About this effort Dr. Bruce Jette stated, “by taking full advantage of rapid prototyping and acquisitions authorities provided by the Congress, the Army will deliver this critical capability quickly and cost effectively" (Jette as cited by Ashley, 2018, para. 2). The MPF mission is to neutralize prepared enemy positions and bunkers with additional capabilities designed to defeat heavy machine guns and armored vehicles. At the time of the rapid prototyping contract award, the Army had not yet selected a combat vehicle platform for the MPF. GEN John M. Murray who was at the time the commanding general for the Army Futures Command, stated that Infantry Brigade Combat Teams would get the systems faster by accepting short-term schedule risks, a hallmark of the MTA pathway (Ashley, 2018). In the December 2018 Army ALT article, author John Ashley acknowledged the Army’s innovative acquisition approach by “focusing on delivering an essential new capability to the [Infantry Brigade Combat Team] under a significantly reduced timeline compared to traditional acquisition efforts” (Ahsley, 2018, para. 5). Ashley went on to state that in the face of expanded capabilities of our enemies the Army must “maintain military technological superiority and overmatch” citing the MTA pathway as one of the tools Congress provided the DoD which is “designed to accelerate the acquisition process” (Ashley, 2018, para. 7). The MPF program successfully transitioned to an MCA in June 2022 entering at MS C.

Army - Next Generation Squad Weapons (NGSW)

The NGSW program integrates advanced technology to mitigate dismounted threats with fire control and aim augmentation technologies, advanced munitions, and an improved platform.

The program was an iterative, prototyping effort that used MTA authorities. The Army initiated the NGSW following previous attempts to replace the ubiquitous M4 carbine. M4 replacement efforts were plagued by several setbacks including unreachable reliability requirements (Cox, 2013). The NGSW program, initiated in 2017, completed system and performance requirements in less than a year, completed initial hardware design in approximately one year, and conducted user evaluations less than three years from program start (Towers, as cited in the 2019 Armament System Forum, 2019, slide. 132). Following 27 months of prototyping and evaluation the Army awarded SIG Sauer the NGSW program's rifle contract and Vortex Optic the fire control contract, both as MTA rapid fielding programs.

Navy – Medium Unmanned Surface Vehicle (MUSV)

The MUSV is a component of the Navy's next generation unmanned/partially manned fleet (O'Rourke, 2020). PEO Unmanned and Small Combatants is developing the MUSV as an MTA program. Naval personnel familiar with the MUSV have commented on the rapid development of advanced technologies necessary for unmanned/partially manned systems (May, 2022). Technology enabling the MUSV to work is based on capabilities developed by the Defense Advanced Research Projects Agency (DARPA). As a requirement to integrate with the Navy's command and control (C2) solution, an ongoing MCA for the Navy's Large Unmanned Surface Vehicle (LUSV) program, the MUSV must use DARPA's artificial intelligence technologies to integrate with the C2 network (May, 2022). Senior Navy officials claim that technologies supporting the MUSV are cutting edge, but not entirely new (May, 2022). Members of Congress have expressed skepticism.

In recent years, some in Congress claimed that the Navy has had problems developing advanced technology vessels from failure to assess technology maturity (May, 2022). Navy

representatives have "expressed confidence in relying on technology that has already been developed to unstated levels of maturity" (May, 2022. 151). Recall as previously stated, there is no requirement to assess technology readiness under MTA authority (Department of Defense, 2019b, *supra* note 4, table 1, n.4.).

After the Navy awarded the MUSV contract in July 2019, the Senate Armed Services Committee (SASC) expressed concerns about the Navy's approach to technology development which were codified in the 2021 NDAA. Within the NDAA, Congress "imposed restrictions on the MUSV program that included testing and qualification of propulsion and electrical generation systems for 720 continuous hours without maintenance or repair, and congressional notification before contract award or the obligation of funds" (May, 2022. p. 151). Congress' mandatory testing requirements for the MUSV counter the Navy's desire to move fast and accept risk but illustrate ongoing conflict between execution under MTA authority and increasing demand for oversight.

Space Development Agency (SDA)/United States Space Force (USSF) – Next-Generation Overhead Persistent Infrared (Next-Gen OPIR) System

The SDA's mission is to "iteratively orbit large numbers of satellites equipped with new capabilities as they develop" (Hitchens, 2023, para. 14). The Agency, which was created to use streamlined acquisition authorities to achieve its mission, is using MTA authority to deploy commercial-based Low Earth orbiting (LEO) satellites (Hitchens, 2023). LEO satellites comprise part of the Next-Gen OPIR constellation. On October 1, 2022, the SDA transferred to the USSF.

In his speech to the Defense Acquisition University in January 2020, former Assistant Secretary of the Air Force, The Honorable William LaPlante expressed optimism about SDA's use of MTA to deploy Next-Gen OPIR program (Hitchens, 2023). Secretary LaPlante observed

that the SDA's Next-Gen OPIR effort would field a large quantity of the commercial-based satellites in one to two years using MTA authority (Hitchens, 2023). Lawmakers, however, have expressed concern about how the SDA is using multiple MTAs for the Next-Gen OPIR program. Acquiring major capabilities such as the Next-Gen OPIR in this manner, critics claim, obscures total program costs (Hitchens, 2023).

Perspectives on the MTA Pathway and Programs: Critics and Advocates

Critics

Since its very inception, the use of MTA authority has been reviewed and scrutinized. With that scrutiny has come what some in the acquisition community call the "dilution of MTA's" (Lofgren, 2022. para. 4). The list below provides a brief history and summary of critical reviews on MTA authority.

- 2019 – The GAO recommends that the DoD identify information needed to select and oversee MTA programs (Government Accounting Office, 2019). Recommended requirements for the DoD to report on business case elements for potential MTA programs and program performance metrics to assess performance of all MTA programs.
- 2020 – GAO "observed inconsistent cost reporting and wide variation in schedule metrics across MTA programs" hindering oversight and assessment of MTA program performance (Government Accounting Office, 2020a. p. 53).
- 2020 – RAND Corporation identified shortfalls in MTA implementation guidance leading to inconsistencies in MTA reporting (Bub, 2023).
- 2021 – The GAO's report on DoD acquisition reform identifies inconsistent MTA cost reporting and concerns with MTA program data reliability (Government Accounting Office, 2021). Additionally, the GAO 2021 Weapon System Annual Assessment

expressed concerns that Services were avoiding MCA's by developing pieces of a major capability using several MTA programs (Hitchens, 2022).

- 2021 – House and Senate Appropriations Committees question DoD's use of multiple MTA's to rapidly field new major systems in lieu of using a single MCA (Hitchens, 2022).
- 2021 - The Senate Appropriations Committee Defense FY 2021 explanatory statement required DoD leadership to provide additional information for all accelerated acquisition authorities as well as those that govern prototyping (Lofgren, 2022).
- 2022 – The SASC version of the FY23 NDAA requires additional reports for MTA programs including a transition plan, a lifecycle cost estimate, and a test plan (Hitchens, 2022).
- 2022 – Within the FY23 defense spending bill the House Appropriations defense subcommittee criticized the USSF for starting MTA's that were not funded across the Future Years Defense Program (FYDP) (Hitchens, 2022).
- 2023 – The GAO finds that unclear MTA data and reporting guidance reduce Congress' visibility on the structure and scope of MTA program diminishing the oversight role of the USD(A&S) (Government Accounting Office, 2023a).
- 2023 – The GAO's June 2023 Weapon System Annual Assessment claims that "schedule delays and lack of progress in maturing technologies raise questions about MTA programs' overall ability to deliver capabilities more quickly" (Government Accounting Office, 2023b, para. 3).
- 2023 – The FY23 NDAA Joint Explanatory Statement, expresses ongoing concern over the lack of standard acquisition information provided for rapid acquisition

programs (i.e., the lack of independent cost estimates, technology and manufacturing readiness assessments, and test and evaluation master plans) (H.R. 2617 Consolidated Appropriations Act, 2022).

Section 804 of the 2016 NDAA occupies only two pages of PL 114-92. The DODI 5000.80 is a brief (15 page) document providing broad guidance for the implementation of MTA statutory authority. Mandatory program reviews, reporting, and program entry requirements for the MTA were minimal. For example, according to MTA policy MTA programs required five entrance documents for major system acquisitions (four for MTA rapid prototyping), and only one for non-major systems using the MTA pathway (Department of Defense, 2019). Only MTA programs expected to exceed the MDAP threshold required a written decision for the USD(A&S) approving the use of the MTA pathway (Department of Defense, 2019). Over the years since MTA authority was conceived and codified in the 2016 NDAA, criticisms of that authority and implementation have become manifest as changes in statutes and policy.

2017 NDAA - required that all MDAPs executing an MTA provide a summary report to Congress with estimated cost, schedule, and technology risk information. Additionally, the 2017 NDAA changes the term MDAP to exclude MTA programs (Defense Acquisition University, MTA Statutes & Policy section, n.d.). In effect, regardless of the investment into the MTA effort the acquisition was still not considered an MDAP. (DAU, MTA Statutes & Policy section, n.d.).

2018 NDAA - Section 866 of the 2018 NDAA eliminates cost-sharing for rapid prototyping projects across military departments to ensure all participating entities are appropriately committed to the project's success (DAU, MTA Statutes & Policy section, n.d.).

2020 NDAA – Section 830 extended the 2017 NDAA requirement for cost estimates, program schedules, and technology risk information to include non-MDAP MTA programs

(NDAA FY 2020, Pub. L. No. 116-92, § 830, 133 Stat. 1198, 1492 (2019). Additionally, Section 837 required the Secretary of Defense to provide reports on procedures for tailoring MTA acquisition methods resulting in publication of the DODI 5000.80.

2023 NDAA – Directs the USD(A&S) to submit an assessment of existing planning processes for MTA programs not later than 30 July 2023. This included descriptions of processes and procedures for a potential transition pathway(s) to an existing or planned program of record, a lifecycle cost estimate, and a test plan to verify desired performance goals (NDAA FY 2023, Pub. L. No. 117-263, No. 136 Stat. 2395 (2022)).

According to May (2022) since MTA authority became law, "Congress has continued to impose new requirements that threaten individual programs and the potential success of the MTA pathway" (p.147). May (2022) asserts further that NDAA changes have "imposed additional layers of oversight and bureaucracy on a process that Congress intended to streamline" (p.147).

Advocates

The critical findings notwithstanding, advantages of MTA authority and the flexibility afforded to PMs is evident in associated literature. The following are examples of more positive perspectives on MTA authority.

On April 9, 2021, the Department of the Air Force released the Fiscal Year 2019/2020 Acquisition Biennial Report. Within that report then acting assistant secretary of the Air Force for Acquisition, Technology, and Logistics, The Honorable Darlene Costello touted the Air Force' successful use of MTA authority to tailor or eliminate non-value-added steps in the acquisition process (Secretary of the Air Force Public Affairs, 2021). Using MTA programs and other rapid acquisition authorities, the Air Force had eliminated 100 years from program

schedules and identified 83 years of program accelerations (Secretary of the Air Force Public Affairs, 2021).

In September 2021, the DoD IG issued an audit report where it found that "internal controls over DoD management, oversight, and execution of programs in the MTA pathway were effective as they applied to the audit objectives" (DoDIG, 2021. Findings.). The DoD IG report also stated, "use of the MTA pathways increased efficiencies and effectiveness by streamlining acquisition processes and expediting prototyping and fielding efforts" (DoDIG, 2021. Findings.).

In their 2022 article titled *Get to Know the Middle Tier of Awesome…Er, Acquisition* the authors highlight beneficial features of six notable MTA programs:

- Next Generation Squad Weapons. Compared to traditional acquisition processes, MTA's abbreviated requirements process shortened weapon development by two to three years.
- F-15EX. The Air Force used the MTA pathway to upgrade fighter aircraft in less than three years.
- Angry Kitten Combat Pods. The Air Force completed the improved electronic warfare pod operational assessment in two weeks.
- Wideband Satellite–Expeditionary. The USMC's rapid fielding MTA used proven commercial technology to knock a full year off the system's fielding schedule.
- Robotic Combat Vehicle. Avoiding lengthy follow-on programs typical of traditional acquisition methods, the Army used MTA authorities to complete repeated hardware and software upgrades to robotic vehicle.

- Optionally Manned Fighting Vehicle. Avoiding pitfalls that had previously plagued past programs, the Army used rapid prototyping to develop realistic performance requirements.

  (MacGregor et al., para. 5)

In general, advocates claim that "MTA accelerates learning and focuses leaders and practitioners to identify opportunities to lean processes, tailor documents, and rethink strategies" (MacGregor et al., 2022. Conclusion section, para. 1).

In Kaitlyn R. Bub's 2023 Naval Post Graduate study, *Analysis of Rapid Prototyping within the DoD*, she states that both the growth in the number and budget of MTA programs between 2019 and 2021 demonstrates the DoD's emphasis on rapid development (p. 15). One of the reasons for such rapid growth in the use of MTA authorities may be the significant reduction in reporting requirements. As Bub states, "the statutory and regulatory requirements" … "were reduced [from the traditional acquisition process] from 33 reports to 10" (Bub, 2023. p. 18). Reduced reporting requirements ease the administrative burden on acquisition program offices and allows them to adhere to the MTA's restrictive timeline. A 2021 Inspector General audit of MTA programs revealed an average 13.8 months were saved in five rapid prototyping programs and six rapid fielding programs with reduced reporting requirements (DoDIG, 2021).

Finally, the preeminent source of information on the subject, the Assistant Secretary of Defense for Acquisition provides three unique advantages of the MTA pathway, as follows:

1) Reduction of risk and cost savings to the department. MTA programs reduce risk by requiring programs to demonstrate operational capabilities during rapid prototyping. Early determination of a technology's operational performance, cost, and sustainability reduces cost.

2) Creates new business opportunities and paves the path for more innovative solutions. Rapid prototyping efforts that are smaller in scope encourage the participation of smaller business concerns in defense acquisition.
3) Acceleration of capability development. The acquisition community can adopt or rapidly develop a mature capability in shorter, more focused timelines than traditional acquisition approaches.

(DAU, n.d. https://aaf.dau.edu/aaf/mta/policy/)

Summary

Literature reviewed for this study provides contextual background of the MTA pathway to include acquisition reform efforts since the 2009 WSARA, recent changes in the strategic security environment precipitating the need for a new defense acquisition approach, and summaries of DoD and Army implementation policy. The review also provides real world data from the USD(A&S) definitive tracking database to bound the magnitude and scope of MTA programs. Finally, the review offers summaries of literature providing qualitative perspectives on MTA authorities, the practice of those authorities by the DoD acquisition community, and attributes of MTA authority. The information reviewed provides the underpinning for a qualitative examination of the effectiveness of the MTA pathway to deliver military capability at the speed of relevance. The next section provides the detailed research methodology supporting this study.

Research Methodology

This section describes the research methodology for this qualitative research paper. Creswell (1994) defines qualitative research as "...an inquiry process of understanding a social or human problem based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting" (Creswell, 1994, pp. 1-2).

The purpose of this section is to describe the method employed to conduct the research for this study, how data and information were searched, extracted from sources, compiled, consolidated into substantiating evidence to conduct the study, and analyzed to derive findings and conclusions. Research was guided by the study purpose statement and research questions which are re-stated below to orient the reader.

Statement of Purpose and Research Questions

The purpose of this study is to examine the effectiveness of the MTA pathway to deliver military capability at the speed of relevance. To achieve this purpose the research presented in this study will answer the following questions:

1. Why was MTA authority established?
2. What is the purpose of MTA authority?
3. Is MTA implementation delivering military capability at the speed of relevance?

Research Methodology

Research for this qualitative study was divided into three areas to align with the research questions. These three areas are acquisition reform, MTA authority, and MTA implementation. The study employed thematic analysis to categorize data and identify repeated themes in the literature. The thematic analysis approach sought key insights from acquisition reform, national

security, and defense acquisition practices that could address research questions. This aided in the development of the findings and conclusions presented later in this paper.

The research process involved developing a series of increasingly refined interrogatives from the three primary research questions listed above. Information and data acquired in pursuit of the interrogatives ‘what’, ‘why’, ‘when’, and ‘how’ provided a historical and contextual foundation from which declarations of facts and statements of inferences were derived. Research material sampling criteria were established. The criteria limited the period for sampling potential research materials from the 1985 Packard Commission to December 2023 when research for this study was concluded. Additional criteria restricted searches to materials directly related to the MTA and related support systems. Exceptions occurred when it was necessary to describe characteristics of the MTA within the context of the overarching material acquisition strata (e.g., the Defense Acquisition System).

Research information and data were organized by primary subject, source, and relevance to the main research questions and their subordinates. Material was organized into a database which could be filtered, limited, and sequenced by topic, sub-topic, source, source location, key word, and grouped by applicable research question. Themes or patterns within research material to analyze meaning beyond what was stated or written.

Summary

A qualitative approach to “research is concerned with subjective assessment of attitudes, opinions, and behavior” (Kothari, C. 1985. p. 5). Research included thematic analysis of literature seeking patterns that ascribe meaning to each primary area of investigation (i.e., acquisition reform, security and technology environment, and MTA implementation). Examining the effectiveness of the MTA to achieve its intended purpose cannot at this time be measured

quantitatively (e.g., by cost avoidance, program schedule, or empirical assessment of tactical and operational effectiveness of systems fielded using the MTA pathway). Therefore, information that infers behavioral patterns within the acquisition community, opinions of acquisition professionals and technology producers (commercial and governmental), and opinions of experts pertaining to the MTA's effectiveness serve as the basis and foundation of this qualitative study. The next section presents the findings of this qualitative analysis that support conclusions pertaining to the MTA's effectiveness in delivering military capability at the speed of relevance.

Findings

Introduction

The purpose of this study was to examine the effectiveness of the MTA pathway to deliver military capability at the speed of relevance. The first three sections of this research paper introduced the problems surrounding MTA authority and its implementation, a review of literature related to MTA development, implementation, and use, and the methodological design that was used for this study. This chapter will now present the findings emerging from research material collected and analyzed using the conceptual framework.

Review of literature describing the MTA, its history, purpose, and usage revealed common and dominant themes that answer the research questions and fulfill this study's purpose. These summarized findings address each of the research questions listed below.

Statement of Purpose and Research Questions

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1. Why was MTA authority established?
2. What is the purpose of MTA authority?
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Results From Research on Acquisition Reform and the National Security Environment

The information below details findings in the areas of acquisition reform, and changes in the strategic, operational, and technological environment. These findings address the research question: Why was MTA Authority Established?

The Middle Tier of Acquisition (MTA) authority was established in the 2016 NDAA as a response to the need for faster and more efficient defense acquisition processes. The emergence of MTA can be traced back to the broader context of acquisition reform. However, changing national security threats, the need for a more adaptive warfighting approach, and an unprecedented pace of technological advancement required more than an evolutionary step in reform.

The DoD had a long history of attempting to reform its weapon system procurement processes prior to developing MTA authority, with various initiatives aimed at delivering products faster, better, and cheaper. Over the years, reforms addressed issues such as cost growth, oversight structures, workforce improvement, acquisition streamlining, use of commercial products, and reduction of development cycle times.

Throughout the past several decades economic realities and resultant statutes contributed to defense budgetary constraints. Sequestration and statutes such as the 2011 Budget Control Act prompted efficiency initiatives like BBP. While early BBP policies focused on reducing defense acquisition costs, there was an increasing recognition of the need to prioritize shortening cycle times.

As concerns about foreign technological superiority grew, focus within Congress and the DoD emphasized expediting schedule. Members of Congress and DoD Senior Leaders recognized that the rapid pace of technological advancements and the competitive efforts in the commercial sector to drive down the cost of technologies had become critical. Innovations in military force operation and technology development became central to adapting to future challenges.

The MTA authority was established to address the inefficiencies and challenges in traditional defense acquisition processes, particularly in response to the evolving strategic and

technological landscape. MTA authority addressed those needs by providing the acquisition community with a more rapid and adaptive acquisition approach.

Results From Research on MTA Authority and Policy

The information below details findings in the areas of MTA authority and the purpose of that authority. These findings address the research question: What is the Purpose of MTA Authority?

The Middle Tier of Acquisition (MTA) was established by Section 804 of the FY2016 NDAA to provide more rapid and flexible acquisition pathways between major capability acquisitions and urgent capability acquisitions. The MTA has two pathways - rapid prototyping to demonstrate new capabilities, and rapid fielding to upgrade existing systems. MTA programs are intended to develop and field initial capabilities within 5 years.

MTA pathways are designed to reduce bureaucracy and accelerate capability development. Programs using these pathways are exempt from certain policies such as the Joint Capabilities Integration and Development System (JCIDS) process. MTA programs can use abbreviated capability documents rather than full Capability Development Documents. Programs executed under MTA authority are also exempt from mandatory Technology Readiness Assessments prior to starting development.

The rapid prototyping and rapid fielding pathways have different objectives. Prototyping is focused on demonstrating potential capabilities, while fielding aims to field new or upgraded capabilities. Rapid fielding leverages proven, mature technologies to enable faster production. The pathways also differ on documentation requirements such as product support strategies and testing.

The end goal of MTA programs is determining a transition path - whether to an existing program, a new acquisition program, a different pathway, or directly fielding the capability. Rapid

prototyping programs may produce a prototype for further development or provide a limited operational capability. Rapid fielding aims to field a production capability meeting minimum criteria.

"A–CDDs do not contain requirements, they contain desired characteristics that only define a possible threshold that provides military utility in order to provide the [Material Developer] the most trade space and flexibility in developing a solution" (Department of the Army, 2021. p. 26).

The MTA was established to address the need for a more rapid defense acquisition capability, as traditional acquisition processes were deemed to be slow and hindered by organizational and cultural impediments. The purpose of the MTA pathway is to streamline the defense acquisition process and regulations, allowing for faster cycle times and better outcomes.

Section 804 of the NDAA for Fiscal Year 2016 established the Middle Tier of Acquisition for Rapid Prototyping and Rapid Fielding. The USD(AT&L) published interim guidance in April 2018, granting military departments the authority to implement MTA programs. The DODI 5000.80, published in December 2019, provided formal parameters and management procedures for both MTA pathways.

In summary, the MTA authority aims to expedite the defense acquisition process by introducing flexible pathways, reducing oversight, and fostering innovation through rapid prototyping and rapid fielding. It addresses the limitations of traditional acquisition approaches and promotes a more agile and responsive system.

Results From Research on MTA Implementation

The information below details findings in MTA implementation across the DoD and service agencies. The findings presented below address the research question: Is MTA implementation delivering military capability at the speed of relevance?

Findings are derived from public domain articles published by members of the acquisition community, related research papers from peer reviewed sources, and government reports. This study acknowledges that the sources reviewed to develop findings may reflect biases of the author(s) or the organization of the source.

This research discovered predominantly bifurcated perspectives on MTA implementation. Notably, analysis of literature revealed that the perspectives of acquisition practitioners tended to view MTA authority and policy favorably. Information obtained from government reports tended to be more critical of MTA authority, particularly in how the Services have used that authority.

Analysis of Government reporting on the Service's use of MTA authorities revealed three recurring and dominant themes:

Theme #1 – Program Rigor: MTA programs tend to exploit MTA policy flexibilities for expediency reducing programmatic rigor. Specifically, shortfalls were identified in cost estimating, cost reporting, and schedule adherence.

Theme #2 – Technology Readiness: MTA program issues with cost growth and schedule delays are most typically related to insufficient assessment of TRL prior to program initiation.

Theme #3 – Program Data: MTA policy inhibits visibility of key program data.

Analysis of non-government reports revealed five recurring and dominant themes:

Theme #1: Quick Startup. MTA authority exemptions and processes reduce program start-up time. MTA eliminates the requirement for formal, JCIDS-approved requirements. This shortens time from identification of need to product realization.

Theme #2: Fail Fast/Learn Fast. MTA programs allows PMs to test, evaluate, fix, and re-test through execution, allowing programs to uncover problems quickly, make modifications, and develop alternative solutions.

Theme #3: Speed vs. Rigor. Critics of MTA authorities want more data, deliberation, and decisions. The desire for increased administrative rigor threatens to add time and complexity to a process designed for speed. Audits, reports, and Congressional reviews point to problematic oversight and implementation while MTA programs continue to produce results.

Theme #4: Better Requirements Equals Better Systems. Developing requirements through iterative prototyping and demonstration enables the formation of more effective, realistic, and achievable performance requirements necessary for large scale production, system deployment, and system sustainment. The "desired characteristics" from an A-CDD (vs. system-level performance requirements from a CDD) allows requirements developers, PMs, and Warfighters to develop, quantify, scope, and evolve future thresholds and objectives.

Theme #5: Alignment to the Operational Environment. Acquisition reform efforts over past decades have fallen short in achieving reform objectives. The focus on cost, schedule, and performance has dominated changes and sidelined learning and innovation. Acquisition processes that are outpaced by technology advancement and emergent peer competitors do not align acquisition with the operational environment.

Summary of Findings

Research for this study spanned such broad topics as acquisition reform, MTA policy and implementation, and details on specific instances of MTA usage. The findings from research identified differing perspectives on MTA authority and trends that were summarized as themes. The next section presents conclusions, recommendations, and areas for further study.

Conclusions and Recommendations

Introduction

This section provides a summary of conclusions derived from research examining the effectiveness of the MTA to deliver military capability at the speed of relevance. Included in this section are recommendations to preserve the efficacy of the MTA in achieving this purpose. The research scope for this study constrained exploration into related and supporting areas. Suggested areas for future research are provided to extend the body of knowledge pertaining to the MTA as an essential component of defense acquisition.

Conclusions

Conclusion #1:

Research provided evidence that both acquisition reform efforts since the 2009 WSARA and changes in the strategic security landscape necessitated a transformation of defense acquisition methodology. This transformation included new acquisition authorities such as the MTA.

When the 2009 WSARA was issued, U.S. forces were still deeply engaged in COIN operations where troop commitments in Iraq and Afghanistan focused the DoD on the close fight. Defense acquisition efforts responded to and prioritized real-time and near-term threats. The 2009 WSARA, with its emphasis on prototyping, extended the DoD's horizon beyond the current fight pushing the Services to keep up with the pace of technology.

While prototyping was the DoD's measure to satisfy immediate needs of forces engaged in the Mideast, it may have had other, more enduring effects. The acquisition workforce began to adopt the "fly before you buy" mentality and the DoD began to come to terms with the velocity of technology advancement.

Sequestration in 2011 and 2013 tempered the DoD's ability to exploit advances in technology, particularly in the commercial sector. The Honorable Frank Kendall's Better Buying Power initiatives attempted to balance defense investments on newer technologies with sustainment costs for existing systems. The 2014 QDR, however, was a clarion call commanding the attention of Congress and the DoD. The 2014 QDR appears to have provided the impetus for acquisition authority somewhere between major system development and addressing urgent needs. Further, it initiated the intellectual framework for a more agile acquisition approach as well as a fundamentally new warfighting concept. This agile approach became manifest in two pages of the 2016 NDAA under Section 804, signed into law in 2015. The Multi-Domain Operations warfighting concept followed. These interdependent methodologies influenced how the DoD would modernize the force and fight that force in future battles.

Conclusion #2:

Research from defense acquisition practitioners executing MTA programs indicates that MTA authority offers defense acquisition PMs flexibility and expediency by expediting program initiation and by reducing programmatic oversight and reporting requirements. Further, these measures are essential for maintaining pace with the national security environment.

The 2022 National Defense Strategy "directs the [DoD] to act urgently to sustain and strengthen U.S. deterrence, with the People's Republic of China as the Department's pacing challenge" (Department of Defense, 2022a, p.1) The DoD needs the tools to achieve that directive - the future national security landscape mandates speed and relevance. As pointed out in their 2022 review of MTA programs, MacGregor et al., claim that "If the U.S. military is to keep up with China, far more defense acquisition programs must move toward MTA and pathways like it" (MacGregor et al., 2022, Conclusion section, para. 2). The MTA pathway

provides the agility to modernize the future force with technology developments pushing the edge of what's possible and maintaining advantage in tomorrow's great power competition.

Conclusion #3

While government reports on MTA programs and implementation appropriately identify ways defense acquisition practitioners can improve MTA usage, few of those issues warrant fundamental changes to MTA authority. Changes such as requiring full funding certification for MTA programs can delay MTA program initiation or otherwise burden PMs with MCA-like requirements.

As noted in the literature review, the GAO reported that shortfalls in data collection and reporting can inhibit visibility into weapon system costs. More specifically, insufficient reporting "makes full cost … of the eventual weapon system more difficult to ascertain" (GAO, 2021, What GAO Found section, para. 3). While not conclusively correlated to the GAO report one can logically deduce that the report influenced language in the FY23 omnibus appropriations act. The FY23 NDAA Joint Explanatory Statement accompanying the Consolidated Appropriations Act, 2023, directs the DoD "to certify full funding of the acquisition strategies for MTA programs in the upcoming fiscal year 2024 President's budget request" (United States Senate, 2023, p. 161). Full funding certification certifies that a DoD component will fund a program to the Component Cost Position (CCP) in the current FYDP or commit to full funding in the future (Department of Defense, 2020b). Full funding certification is a requirement at major program milestones, full deployment decisions, or full rate production decision reviews. These are requirements of MCA programs; MTA programs do not have major program milestones. Prior to the FY23 act full funding certification was not required for MTA programs.

Recommendations

Recommendation #1:

The DoD should sustain the expediency of MTA processes, while balancing Congressional demands for oversight. However, simply increasing the frequency of reports on program status will not satisfy demands for increased oversight. And doing so risks burdening PMs with additional administrative requirements that won't necessarily mitigate program risks or improve program outcomes. Asking PMs for the right data, at the right times will ensure that senior leaders and decision makers have and maintain visibility of MTA programs from approval through transition. The 'right' data traditionally includes program costs, program schedule, performance measurements of the capability developed, and program risks. Among these traditional measurements, MTA program costs appear to be the most vexing reporting element. More specifically, program cost estimates. MTA program cost data appears also to be the most important program elements to oversight authorities.

Estimating MTA program costs is challenging for several reasons. Iterative prototyping makes accurate cost estimating a difficult proposition. Typically, prototyping involves producing a limited quantity of items. The lack of economy of scale can drive up cost per prototype. When the number of prototype iterations is unknown the effects of lack of economy of scale is amplified.

Other cost uncertainties exist in the iterative process itself. Success in prototyping is learning through failure. Lessons learned from failure become the design improvements of subsequent prototypes. Those prototypes are tested, failures identified, and improvements integrated into the next or future iterations. Predicting what failures will occur and the cost to eliminate or manage those failures is imprecise. The end state of iterative prototyping, whether it

is an actual hardware or software product or detailed knowledge about that product makes iterative prototyping invaluable for at-scale acquisition and procurement programs.

Another challenge with cost reporting is that PMs managing MTA programs only develop cost estimates for the program(s) they are executing, not "potential investments after the current MTA effort" (GAO, 2021, What GAO Found section, para. 4). This can propagate into claims of obfuscation and a lack of transparency resulting in demands for increased constraints on MTA authorities. Balance is struck when both acquisition practitioners and law makers meet in the middle. For example, PMs managing MTA rapid prototyping programs can use TRAs to determine technology maturity either before or early after program start. This can improve cost estimate accuracy (May, 2022; Tirpak, 2022). TRAs assess technology maturity providing information that will aid in cost estimating for those critical technologies that will be matured within that distinct five-year MTA project. A PM managing an MTA rapid prototyping effort, therefore should not be held accountable for a requirement that the program does not yet 'own' (i.e., a follow-on acquisition program). When cost estimates for follow-on efforts are required, oversight authorities should expect – and accept – significant variability between early cost estimates (e.g., before program initiation) and those developed at the end of the rapid prototyping program (e.g., as part of the transition plan).

Recommendation #2:

Acquisition practitioners should further exploit novel applications of the AAF to integrate MTA pathways with other acquisition approaches while avoiding practices that jeopardize AAF and MTA flexibilities. Both MTA pathways can source major capability acquisitions with continuously updated, more capable products that can be integrated into major capabilities. Doing so not only delivers new capabilities in the near term, but also provides software,

components, and systems to upgrade and sustain existing equipment while advancing technology development for future systems. The integration of MTA pathways with other AAF pathways should not, however, be undertaken as a measure to avoid administrative burden and programmatic oversight associated with the major capability acquisitions or MDAP designation.

Areas for Future Research

As noted in the Findings section, the preponderance of literature indicates a bifurcated body of perspectives on MTA effectiveness or as to whether MTA authority is achieving its intended purpose. On one hand, research presented in this study supports the position that the MTA is effective in delivering military capability at the speed of relevance. That evidence is based primarily on the perspectives from the professional acquisition community. On the other hand, there is evidence indicating that because MTA policy and implementation can obfuscate costs and limit oversight, MTA authority and execution of that authority is problematic. Government reports indicate that measures for increasing programmatic transparency are therefore necessary. Given the MTA's relative recency as acquisition policy both views may reflect forms of unconscious bias. Biased decisions that modify MTA authority and policy may irreparably damage the DoD's ability to achieve technological overmatch with near peer competitors. Research that confirms the presence or absence of bias in definitive reports on MTA authority, policy, implementation, and programs will help avoid unintended consequences.

Defense acquisition programs are measured against cost, system performance, and schedule metrics. Of the 135 MTA active programs that were annotated in the DAVE when research for this study was conducted approximately 25 were transitioned or restructured. Most MTA programs remain in the execution phase. Comprehensive data pertaining to MTA program cost, schedule, or performance is not yet available. As more MTA programs achieve their

objectives, transition to follow-on acquisition programs, or reach the five-year limit cost, schedule, and system performance data should be captured and analyzed. However, this data alone will not determine MTA's effectiveness. Nor will this data alone serve as the basis for modifying MTA authority and/or implementation policy. Additional research revealing whether the capability produced via one of the MTA pathways was in fact relevant in the operational environment when fielded would help determine if MTA pathways enable the DoD field capabilities at the speed of relevance. Further, assessing how long the capability remained relevant in the operational environment would further that analysis and reinforce the benefits of MTA authority.

Summary

This research has shown that the MTA provides needed agility and flexibility to enable rapid defense capability development at the speed of technological change. The MTA authority was created in response to shifts in the strategic environment and recognition that new approaches were required to counter rising threats and maintain advantage. Evidence indicates the MTA effectively expedites program initiation, prototyping, and fielding to deliver timely, relevant capabilities. However, challenges remain in balancing oversight demands with the need for acquisition speed and transparency. Recommendations focus on sustaining MTA expediency while improving cost estimating and integration with other acquisition pathways. Further research can confirm MTA effectiveness over time and guard against potential biases that could undermine this valuable authority. With continued prudent implementation, the MTA presents a model for equipping the future force.

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Appendix A – Glossary of Acronyms

3DELRR…….	Three-Dimensional Expeditionary Long-Range Radar
AAE……	Army Acquisition Executive
AAF……	Adaptive Acquisition Framework
ADM……...	Acquisition Decision Memorandum
ALT……	Acquisition, Logistics & Technology
AR……..	Army Regulation
ASD……	Assistant Secretary of Defense
ATL……	Acquisition, Technology & Logistics
BBP……	Better Buying Power
C2……...	Command and Control
C3T…….	Command, Control, Communications - Tactical
CCP……	Component Cost Position
CDD……	Capabilities Development Document
CERP……..	Commercial Engine Replacement Program
COIN……..	Counter-Insurgency Operations
CRS…….	Congressional Research Service
DAPA…….	Defense Acquisition Performance Assessment
DARPA……...	Defense Advanced Research Projects Agency
DAS……	Defense Acquisition System
DAU…….....	Defense Acquisition University
DAVE…….	Defense Acquisition Visibility Environment
DAWIA……...	Defense Acquisition Workforce Improvement Act
DEVCOM……...	U.S. Army Combat Capabilities Development Command
DOD……	Department of Defense
DODD…….	Department of Defense Directive
DODI……...	Department of Defense Instruction
DODIG……	Department of Defense Inspector General
DTIC……...	Defense Technical Information Center
ERCA……..	Extended Range Cannon Artillery

FY…… Fiscal Year
FYDP…….. Future Years Defense Program
GAO…… Government Accounting Office
GDP……. Dross Domestic Product
ICD…….. Initial Capabilities Document
IG…… Inspector General
ITN…….. Integrated Tactical Network
JCIDS…….. Joint Capabilities Integration and Development System
LEO……. Low Earth Orbit
LUSV……... Large Unmanned Surface Vehicle
MCA…… Major Capabilities Acquisition
MDAP……. Major Defense Acquisition Process
MDO…… Multi-Domain Operations
MPF……. Mobile Protected Firepower
MS……... Milestone
MUSV…….. Medium Unmanned Surface Vehicle
NDAA…….. National Defense Authorization Act
NDS……. National Defense Strategy
NGSW……. Next Generation Squad Weapons
NSS…….. National Security Strategy
OPIR…… Overhead Persistent Infrared
OPSEC……. Operational Security
PEO…….. Program Executive Office
PL……. Public Law
PM…… Program Manager
PPBE…… Planning, Programming, Budgeting, and Execution
QDR……. Quadrennial Defense Review
SAR…….. Selected Acquisition Report
SASC……... Senate Armed Services Committee
SDA…….. Space Development Agency
SOCOM……... Special Operations Command

TRA…….. Technology Readiness Assessment
TRL…….. Technology Readiness Level
UCA……. Urgen Capability Acquisition
UNO……. Unified Network Operations
USA…….. United States Army
USAF……... United States Air Force
USC…….. United States Code
USD…….. Under Secretary of Defense
USMC…….. United States Marine Corps
USSF…… United States Space Force
WSARA……... Weapon System Acquisition Reform Act

Appendix B – Author Biography

Mr. James (J.D.) Webster is currently serving as the Directed Energy Transition Project Lead, Short and Intermediate Effectors for Layered Defense (SHIELD) Project Office, Program Executive Office for Missiles and Space (PEO M&S). Mr. Webster leads a multi-disciplined team of Department of the Army Civilians and support contractors responsible for leading the transition of two directed energy weapon systems from the U.S. Army Rapid Capabilities and Critical Technologies Office to an Army program of record in PEO M&S.

He is a Department of the Army Civilian with previous assignments as the Product Director for the Joint Tactical Ground Station (PEO M&S), Director for Industrial Operations, and Director of the Condition Based Maintenance program for the U.S. Army Aviation and Missile Command.

Prior to joining the Department of the Army Civilian workforce Mr. Webster served in leadership and key supervisory positions in the defense industry and as an Army officer. His defense industry experience includes serving as Director Aviation and Missile Applied Research & Development Programs and Program Manager for the National Applied Software Engineering Center (NASEC) where his primary work focused on the development of advanced decision support systems under a DARPA research grant; Theater Liaison for the Program Director, Aircraft Survivability Equipment deployed to Operation Iraqi Freedom responsible for the oversight and coordination of theater-wide contractor support during the fielding of the Common Missile Warning System; and as the Program Manager for the TOW ITAS - Tactical Engagement Simulation System.

Mr. Webster is a 21-year veteran of Army Aviation with assignments on the Department of the Army Staff; as the Chief of Current Operations and Chief of Joint Exercises, XVIII Airborne Corps; and as an Apache Helicopter Battalion Commander. He retired in 2006 at the rank of LTC and remains active in retiree advocacy and wounded warrior programs.

He received a master's degree in military arts and sciences from the United States Army Command and General Staff College, and an undergraduate degree from the University of Florida.

Mr. Webster is the father of eight children ranging in age from 29 to 13 years old, two of whom are military members currently serving with the United States Army and United States Navy.