United States Government Accountability Office

Report to Congressional Committees

December 2024

DOD ACQUISTION REFORM

Military Departments Should Take Steps to Facilitate Speed and Innovation

GAO-25-107003

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DOD ACQUISITION REFORM

Military Departments Should Take Steps to Facilitate Speed and Innovation

GAO Highlights

Highlights of GAO-25-107003, a report to congressional committees

Why GAO Did This Study

DOD struggles to promptly deliver capabilities to its warfighters. The 2022 National Defense Strategy emphasized increasing the speed of delivery to meet emerging threats. GAO found in July 2023 (GAO-23-106222) that leading companies iteratively develop cyber-physical products with speed.

House and Senate reports include provisions for GAO to assess the military departments' approaches to implementing DOD's adaptive acquisition framework and incorporating leading practices for product development. This report describes the departments' implementation of the framework and assesses the extent to which their approaches are designed to facilitate speed and innovation in acquisition. To do this work, GAO interviewed officials and reviewed relevant policies and guidance from DOD and the three military departments. GAO selected nine acquisition programs, including at least one from each department, and interviewed program officials and reviewed documentation.

What GAO Recommends

GAO is making a total of six recommendations to the departments of the Army, Navy, and Air Force to each revise acquisition policies and guidance for weapon systems and designate one or more new cyber-physical capabilities as pilot programs that provide lessons learned on using leading practices for each pathway. DOD concurred with four recommendations, and partially concurred with two to the Army, stating that the Army did not consider them fully applicable to a specific pathway. GAO maintains their applicability.

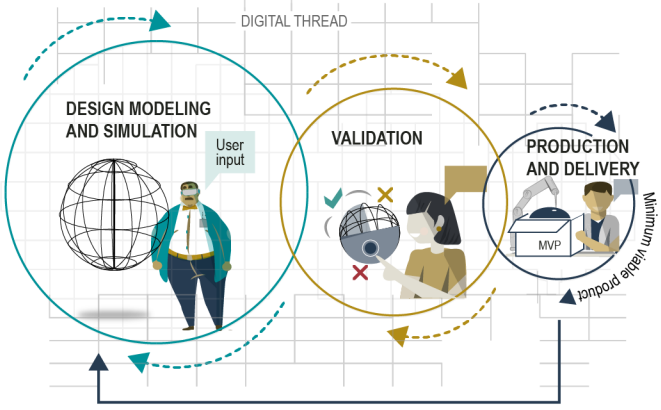
View GAO-25-107003. For more information, contact Shelby S. Oakley at (202) 512-4841 or oakleys@gao.gov.

What GAO Found

The Department of Defense (DOD) revamped its acquisition policies in 2020, with the intent to deliver innovative technologies to the user more quickly. These reforms, known collectively as the "adaptive acquisition framework," established four pathways that weapon system acquisition programs can follow: urgent capability, middle tier, major capability, and software.

Each military department issued policies in alignment with DOD's goals and framework, but these policies do not consistently reflect leading practices. In July 2023, GAO found that leading companies use an iterative development structure that includes continuous cycles of design modeling, validation, and production. These iterative processes enable the companies to get products that combine hardware and software—known as cyber-physical products—to market quickly. The continuous cycles allow the companies to gain specific knowledge, such as assurance that the design meets the most essential user needs.

Iterative Cycles of Design, Validation, and Production to Develop a Minimum Viable Product



Source: GAO analysis of leading company information; GAO (illustration). | GAO-25-107003

While military departments' policies for the software acquisition pathway fully incorporated an iterative development structure, GAO did not find a full structure of iterative development for the urgent capability, middle tier, and major capability acquisition pathways. For example, while Air Force and Navy urgent capability acquisition policies discussed how to refine requirements, they did not include other elements of iterative development such as information on applying user feedback to ensure the design meets essential user needs. Without revised policies and guidance on and examples of how programs can use an iterative development approach, programs across pathways are missing opportunities to deliver capabilities with speed and innovation.

The programs GAO reviewed had different understandings of iterative development. Moreover, some program officials stated that they did not think it applied to or was feasible for their program. A pilot program, resulting in practical examples of cyber-physical products that have used an iterative development structure, could provide future programs with lessons learned and opportunities to acquire weapon systems faster.

Contents

Abbreviations

AAF	Adaptive Acquisition Framework
DAU	Defense Acquisition University
DOD	Department of Defense
MCA	Major Capability Acquisition
MTA	Middle Tier of Acquisition
MTC2	Maritime Tactical Command and Control
NDS	National Defense Strategy
UCA	Urgent Capability Acquisition

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

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Congressional Committees

For the last several years, we have reported on the Department of Defense's (DOD) efforts to increase the speed of delivering capability to the warfighter to meet current and emerging threats—a priority emphasized by a public version of the 2022 National Defense Strategy (NDS). However, we recently found that the average amount of time for major defense acquisition programs to deliver capability increased from 8 to 11 years.[1] To deliver more effective, suitable, survivable, sustainable, and affordable solutions to the warfighter promptly, DOD revamped its department-wide acquisition policies in 2020 and established an Adaptive Acquisition Framework (AAF). The AAF gives more acquisition authority and flexibility to military departments to deliver weapon systems with speed.

In 2023, we assessed the factors contributing to the speed of delivery of DOD's weapon systems, which are increasingly complex cyber-physical systems—co-engineered networks of hardware and software that combine computation, communication, sensing, and actuation with physical systems. For example, satellites and uncrewed vehicles are cyber-physical systems. We reported that leading companies use iterative processes to design, validate, and deliver these kinds of technologies with speed.[2] Activities in these iterative processes include continuous user engagement to help develop and produce a minimum viable product—one with the initial set of capabilities needed for the customer to see value—and continue to improve on it after delivery.

The Senate and House reports accompanying a bill for the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 contained a provision for GAO to assess the military departments' primary

[1]This figure is for programs that have already delivered capability and represents the time from program start to initial operational capability. We found that the average major defense acquisition program that has yet to deliver capability plans to take over 10 years to do so. GAO, *Weapon Systems Annual Assessment: DOD Is Not Yet Well-Positioned to Field Systems with Speed [Reissued with revisions on July 18, 2024],* GAO-24-106831 (Washington, D.C.: June 17, 2024).

[2]GAO, *Leading Practices: Iterative Cycles Enable Rapid Delivery of Complex, Innovative Products*, GAO-23-106222 (Washington, D.C.: July 27, 2023).

acquisition policies.[3] This report (1) describes how the military departments implemented the AAF to align with DOD's strategic goals and policies, and (2) assesses the extent to which the military departments' approaches to implementing the acquisition framework reflect leading practices for facilitating speed and innovation in acquisition.

For both objectives, we interviewed the acquisition offices for the Air Force, Army, and Navy to identify relevant acquisition policies and guidance for implementing the AAF. We reviewed policies and guidance for the four pathways directly relating to weapon systems. For the first objective, we reviewed these policies to understand their alignment with DOD's broader strategic goals and policies, including the 2022 NDS goals and the AAF. For the second objective, we also interviewed acquisition officials and reviewed the relevant acquisition policies and guidance to assess the extent to which Air Force, Army, and Navy approaches reflected leading practices for iterative development.

To further examine the military departments' approaches to implementing the AAF and the extent to which these approaches reflected leading practices for iterative development, we selected nine illustrative examples of acquisition programs. We selected a nongeneralizable sample of programs from each military department as represented in the Defense Acquisition Visibility Environment—the primary DOD resource for acquisition related data—and a list of software programs provided by DOD, as of October 2023. We included a program from the Space Force and one from the Marine Corps as part of our Air Force and Navy examples, respectively. We interviewed the officials from each program and reviewed available acquisition strategy documentation to understand their implementation of the AAF and incorporation of leading practices. Appendix I further describes our objectives, scope, and methodology. See figure 1 for information on our selected programs.

[3]S. Rep. No. 117–130, at 202-03 (2022): H.R. Rep. No. 117–397, at 223-24 (2022). The Senate provision directs GAO to report on the extent to which (1) each service is tailoring acquisition programs to best use AAF flexibilities, (2) each service's acquisition workforce understands how to implement the AAF, and (3) the service acquisition executives and other acquisition leaders are providing guidance to programs on tailoring acquisition programs and monitoring performance. The House provision directs GAO to report on the extent to which the policies are suitable to the stated goals and risk profiles of acquisition programs; consistent with the primary goals and tenets of the AAF; and implement our leading practices for product development.

Figure 1: Selected Weapon System Acquisition Programs

F-22 Rapid Fielding | Air Force | MTA: Rapid Fielding

The Rapid Fielding effort is complementary to the F-22 Rapid Prototyping effort and both programs intend to modernize the F-22 fighter aircraft.

Source: Defense Visual Information Distribution Service

F-15EX | Air Force | MCA

The F-15EX program transitioned to an MCA from the MTA pathway in September 2022, and is intended to address F-15C/D readiness challenges and eventually replace the F-15C/D fleet. The F-15EX aircraft will have upgraded capabilities, including operational flight program software.

Source: U.S. Air Force.

Next-Gen OPIR GEO | Space Force | MCA

Next Generation Overhead Persistent Infared, Geosynchronous Earth Orbit (Next-Gen OPIR GEO) is a missile warning system follow-on program that will consist of at least two geosynchronous earth orbit satellites.

Source: U.S. Space Force.

M-SHORAD Increment 3 | Army | MTA: Rapid Prototyping

Maneuver Short Range Air Defense (M-SHORAD) Increment 3 is intended to modernize the Army's air and missile defenses. The Army plans for the program to have improved targeting capabilities by increasing its range and lethality against threats.

Source: U.S. Army.

Iron Fist Light Decoupled | Army | See note

Iron Fist Light Decoupled is an add-on system to provide protection for close range threats, applicable for armored platforms such as heavy armored fighting vehicles.

Source: U.S. Army.

Robotic Combat Vehicle | Army | Software

The Robotic Combat Vehicle software pathway program will use both commercial and government software capabilities to implement government-owned architecture.

Source: U.S. Army.

Maritime Tactical Command and Control | Navy | Software

Maritime Tactical Command and Control (MTC2) delivers and hosts tools to help plan, direct, monitor and assess maritime operations. The system synthesizes information about the battlespace, allowing Navy Commanders and their staff to coordinate quickly and act on that information.

Source: Developed without copyright by Booz Allen Hamilton in coordination with the MTC2 Program

MQ-25 Stingray | Navy | MCA

The MQ-25 Stingray is a catapult-launched, uncrewed aircraft system designed to operate from aircraft carriers. The MQ-25 is expected to provide the intelligence, surveillance, and reconnaissance capabilities needed to identify and report on surface targets. The system is comprised of an aircraft segment, a control station segment, and a carrier modification segment.

Source: U.S. Navy.

Medium-range Intercept Capability | Marine Corps | MTA: Rapid Prototyping

Medium-range Intercept Capability (MRIC) is a missile system that detects, tracks, identifies and defeats enemy cruise missiles and other manned and unmanned aerial threats.

Source: U.S. Marine Corps/Lance Cpl. M. Bartman.

MCA: Major Capability Acquisition
MTA: Middle Tier of Acquisition

Source: GAO analysis of Department of Defense documentation. | GAO-25-107003

Note: We selected these programs based, in part, on acquisition pathway information as represented in the Defense Acquisition Visibility Environment, as of October 2023. This source identified Iron Fist Light Decoupled as an Urgent Capability Acquisition. Officials from this program noted that it began prior to the Adaptive Acquisition Framework as an engineering change proposal to an existing MCA

program under an urgent material release effort. However, for the purposes of representation in the Defense Acquisition Visibility Environment, they determined Urgent Capability Acquisition to be the best pathway fit for the program. Army officials subsequently stated that a better alignment would be as a Major Capability Acquisition with elements of rapid prototyping and rapid fielding.

We conducted this performance audit from July 2023 to December 2024 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

DOD Strategic Goals and the Adaptive Acquisition Framework

In January 2020, DOD established the AAF to deliver effective, suitable, survivable, sustainable, and affordable solutions to the warfighter in a timely manner, as well as to support the NDS through technological innovation.[4] The NDS contains several acquisition related goals that can be supported by the AAF, including:

1. Implementing rapid experimentation, acquisition, and fielding to incorporate modern technologies;
2. Decreasing the delivery time for software efforts to the warfighter; and
3. Transitioning and divesting from systems that are less relevant and supporting relevant modernization efforts.

The AAF emphasizes several principles that include simplifying acquisition policy, tailoring acquisition approaches, and conducting data-driven analysis. To do so, acquisition oversight responsibilities for weapon systems is shared between several entities within the Office of the Secretary of Defense and the military departments.

The AAF includes six acquisition pathways, four of which are directly related to weapon systems, which have distinct processes for pathway milestones, cost and schedule goals, and documentation.[5] The AAF

[4]Department of Defense, *Operation of the Adaptive Acquisition Framework*, DOD Instruction 5000.02 (Jan. 23, 2020). (incorporating change 1, June 8, 2022).

[5]Throughout this report, we only refer to the four AAF pathways directly related to weapon system acquisition: Urgent Capability Acquisition, Middle Tier of Acquisition, Major Capability Acquisition, and Software Acquisition. The two additional AAF pathways not included in this report are Defense Business Systems and Defense Acquisition of Services.

allows military departments to select one or more pathways for acquiring a weapon system to best match the capability being acquired, as well as tailor and streamline certain processes.

Urgent Capability Acquisition (UCA). UCA pathway programs are to fulfill urgent operational needs in less than 2 years.[6] The goal is for a program to plan for the capability in a few weeks, with development and production measured in months, and then to rapidly deliver useful capability to the warfighter. Figure 2 shows the UCA pathway.

Figure 2: Urgent Capability Acquisition Pathway

DD = Disposition decision

Source: GAO analysis of Department of Defense documentation. I GAO-25-107003

Middle Tier of Acquisition (MTA). MTA pathway programs are to rapidly develop prototypes that can be fielded, or rapidly field capabilities with proven technologies that require minimal development, within 5 years of MTA program start.[7] Additionally, the MTA pathway offers certain flexibilities to the acquisition process, such as not being subject to the Joint Requirements Oversight Council's policies and procedures. These flexibilities help the acquisition process deliver suitable capabilities more quickly and enable DOD to be more responsive to the warfighter's needs. The MTA pathway provides two paths: rapid prototyping and rapid fielding.

- The **rapid prototyping** path is to field a prototype that meets defined requirements, which can be demonstrated in an operational

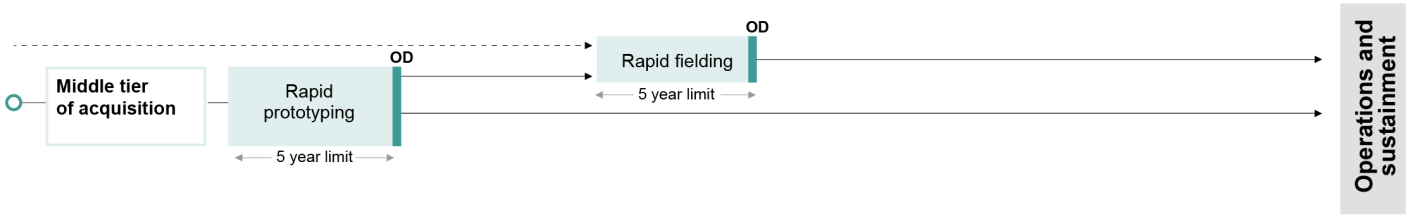
[6]Department of Defense, *Urgent Capability Acquisition*, DOD Instruction 5000.81 (Dec. 31, 2019).

[7]Department of Defense, *Operation of the Middle Tier of Acquisition*, DOD Instruction 5000.80 (Dec. 30, 2019). The National Defense Authorization Act for Fiscal Year 2016 required DOD to establish guidance for an alternative acquisition process, now referred to as MTA, for programs intended to be completed in a period of 2 to 5 years. See Pub. L. No. 114-92, § 804 (2015).

environment and provide for residual operational capability.[8] Additionally, virtual prototypes can meet this requirement if they result in a residual operational capability that can be fielded.

- The **rapid fielding** path provides for the use of proven technologies to field production quantities of new or upgraded systems with minimal development required. A program using the rapid fielding path is to begin production within 6 months. Figure 3 shows the MTA pathway.

Figure 3: Middle Tier of Acquisition Pathway



OD = Outcome determination

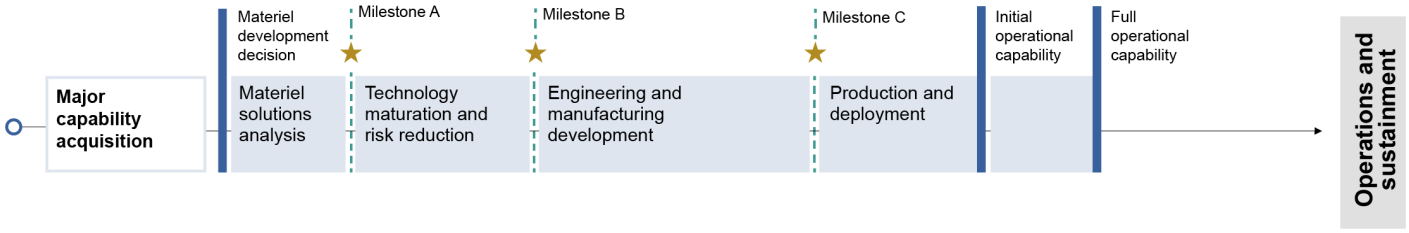
Source: GAO analysis of Department of Defense documentation. | GAO-25-107003

Major Capability Acquisition (MCA). The MCA pathway is designed to support certain complex acquisitions such as major defense acquisition programs.[9] Acquisition and product support processes, reviews, and documentation can be tailored based on the program size, complexity, risk, urgency, and other factors. Figure 4 shows the MCA pathway.

[8]DOD Instruction 5000.80 states that for rapid prototyping programs, residual operational capability is any military utility for an operational user that can be fielded.

[9]Major defense acquisition programs generally include those programs that are not a highly sensitive classified program and that are either (1) designated by the Secretary of Defense as a major defense acquisition program; or that are (2) estimated to require an eventual total expenditure for research, development, test, and evaluation, including all planned increments or spirals, of more than $525 million in fiscal year 2020 constant dollars or, for procurement, including all planned increments or spirals, of more than $3.065 billion in fiscal year 2020 constant dollars. See 10 U.S.C. § 4201(a); DOD Instruction 5000.85 (reflecting statutory major defense acquisition program cost thresholds in fiscal year 2020 constant dollars). Certain programs that meet these thresholds, including programs using the MTA pathway, are not considered major defense acquisition programs. See 10 U.S.C. § 4201(b).

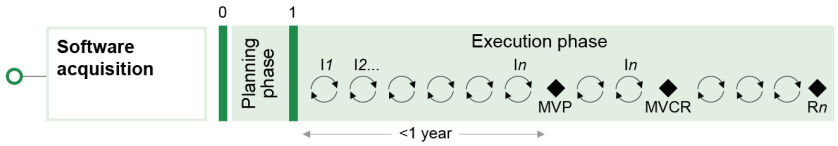
Figure 4: Major Capability Acquisition Pathway



Source: GAO analysis of Department of Defense documentation. I GAO-25-107003

Software Acquisition. The software acquisition pathway establishes a framework for software acquisition and development investment decisions that addresses trade-offs between capabilities, affordability, risk tolerance, and other considerations. Figure 5 shows the software pathway.

Figure 5: Software Acquisition Pathway



I = Iteration
MVCR = Minimum viable capability release
MVP = Minimum viable product
R= Release

Source: GAO analysis of Department of Defense documentation. I GAO-25-107003

Leading Practices for Iterative Development Cycles

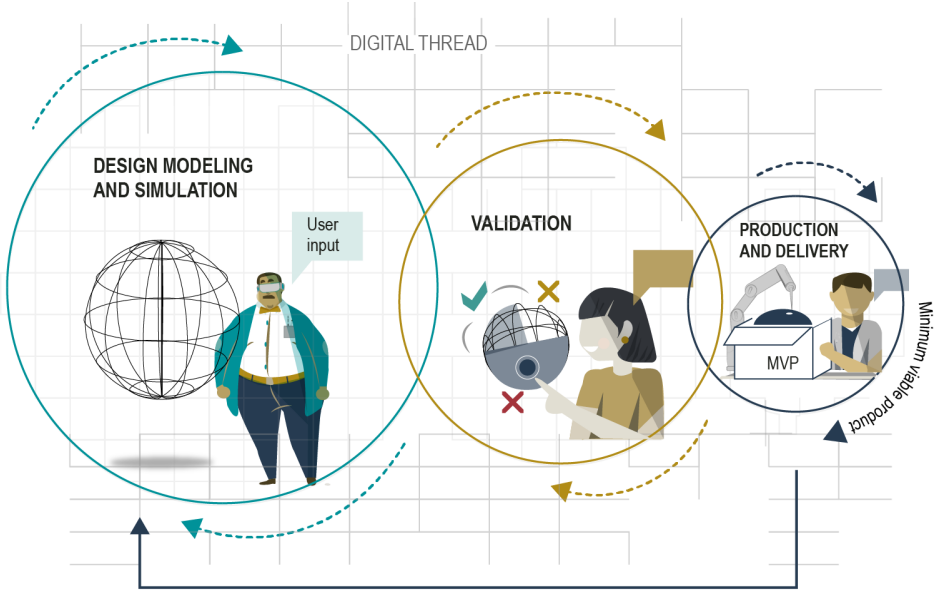
We reported in July 2023 how leading companies use iterative cycles to deliver cyber-physical products with speed.[10] This iterative structure involves continuous cycles that include common key practices, such as obtaining user feedback to inform decision-making and identifying a minimum viable product. The iterative structure is enabled by digital engineering, such as digital twins or digital threads. Digital twins are virtual representations of physical products and incorporate dynamic data of a physical object or system meaning the model changes and updates in real-time as new information becomes available. Digital threads are a

[10]GAO-23-106222.

common source of information that connect stakeholders with real-time data across the product life cycle.

The number of cycles a product requires can vary, but programs would use multiple iterations to ensure all hardware and software needs are validated through testing and user feedback. This structure of continuous cycles enables complex, cyber-physical products to evolve and innovate over future iterations, in a way that differs from implementing some of the same individual practices in a linear fashion to deliver a single product not planned to be improved upon. Figure 6 shows how these iterative development cycles function.

Figure 6: Iterative Cycles of Design, Validation, and Production to Develop a Minimum Viable Product



Source: GAO analysis of leading company information; GAO (illustration). | GAO-25-107003

Each cycle allows an organization to gain specific knowledge. Design modeling and simulation allow an organization to develop specifications that ensure the design meets the most essential user needs. Validation allows an organization to develop an integrated prototype that is tested in multiple environments to verify performance and that can be manufactured as the minimum viable product. Production and delivery allow an organization to optimize manufacturing tools and processes to gain insight into efficiencies for future iterations.

Within these iterative development cycles, leading companies provide funding commensurate with the product's design and development progress, rather than give a product development team a substantial amount of funding up front at development start. This is different from the traditional government approach that generally relies on fully resourcing a project to meet predefined performance requirements at development start. We previously recommended that DOD update its pathway policies and that the military departments update their MTA policies to incorporate our leading practices for iterative development.[11] According to the Office of the Under Secretary of Defense for Acquisition and Sustainment, officials anticipate the MCA and MTA policies will be issued by January 2025.

Military Departments Took Steps That Align with DOD Strategic Goals and Policies, and Differed in Implementation Details

Our review found that all three military departments had policies on using the AAF that align with DOD's strategic goals and policies. For example, military department policies that encourage tailoring processes to deliver capabilities more quickly to the warfighter support DOD's goal of rapid development and fielding. The military departments took a variety of specific steps to implement the AAF.

Military Departments Issued Acquisition Pathway Policies That Align with DOD Strategic Goals and Policies

We observed that all three military departments developed AAF policies that align with DOD's strategic goals outlined in the 2022 NDS. The strategic goals include implementing rapid approaches to develop and field capability solutions as well as supporting modernization. For example, military department policies generally encourage streamlined processes and modern methodologies, which can help programs acquire capabilities quickly and reduce program cost, lower acquisition risk, and avoid technological obsolescence. Department policies also generally encourage programs to balance resources against relevant capability needs. This can include prioritizing modernization efforts over sustainment of less effective and more costly systems, recapitalizing

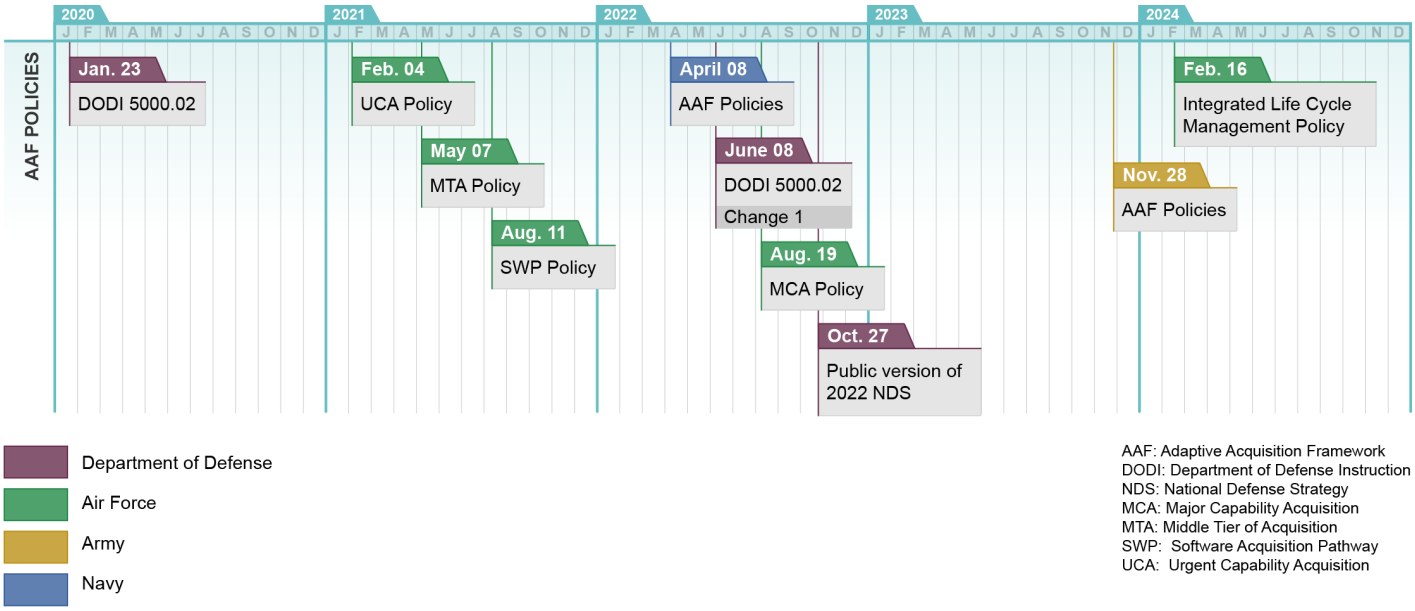
[11]GAO, *Middle-Tier Defense Acquisitions: Rapid Prototyping and Fielding Requires Changes to Oversight and Development Approaches*, GAO-23-105008 (Washington, D.C.: Feb. 7, 2023); and *Leading Practices: Agency Acquisition Policies Could Better Implement Key Product Development Principles*, GAO-22-104513 (Washington, D.C.: Mar. 10, 2022). The military departments concurred with our recommendations and planned to update their policies in 2024. However, they have not yet made these updates.

enduring capabilities, and identifying critical operating and support cost growth life-cycle sustainment plans.

The military departments also developed AAF policies that implement procedural requirements defined in DOD Instruction 5000.02. All three departments established policies that describe decision authorities to tailor program strategies based on the characteristics of the capability and to satisfy user requirements. For example, decision authorities are able to seek appropriate alternatives to regulatory requirements that increase burden without adding value to their programs. They can streamline elements such as product support processes, reviews, and testing and evaluation requirements to accommodate unique program characteristics. Some department policies also enable decision authorities to require stakeholders to adjust program documentation to further streamline the acquisition strategy and promote speed of capability delivery.

Following the establishment of the AAF in January 2020 and the associated update to DOD Instruction 5000.02, each military department developed policies pertaining to the UCA, MTA, MCA, and software acquisition pathways. The Air Force developed separate policies for individual pathways while the Army and Navy each developed a single AAF policy with pathway-specific components. All three departments took steps that align their AAF policies with DOD-level strategic goals and procedural requirements. Specifically, the Air Force established its AAF policies intermittently from 2021 to 2024, while Navy and Army AAF policies were established in 2022 and 2023, respectively. Figure 7 illustrates when DOD and each military department established their AAF policies.

Figure 7: Establishment of Select DOD and Military Department AAF Policies



Source: GAO analysis of Department of Defense information. | GAO-25-107003

Based on our review, the MTA pathway policies for all three military departments align with the NDS goal of implementing rapid experimentation, acquisition, and fielding of modern technologies. MTA policies enable the optimization of production and fielding timelines through customized acquisition strategies for each program, such as via tailored review processes. Selected program officials we spoke with who had experience with the MTA pathway noted this flexibility led to a faster requirement approval process and the ability to make small changes over time as systems were tested and matured. They found this flexibility also made it easier to prioritize requirements in response to user feedback on the MTA pathway than the MCA pathway.

The software acquisition pathway policies for all three military departments align with the NDS goal of decreasing delivery time for software efforts to the warfighter through their streamlined processes and capability releases. Robotic Combat Vehicle program officials described this flexibility as allowing them to “fail fast, fail often, and learn.” Selected program officials we spoke with who had experience with the software pathway noted an additional benefit of this pathway is increased prioritization of software development efforts by military department leadership. They found they received more frequent and consistent input

from department leadership regarding software efforts on the software pathway than on the MCA pathway.

Officials from each military department we interviewed stated that they rely on the Defense Acquisition University (DAU) to provide training about the AAF pathways. DAU officials we spoke with stated they developed training courses and guidance to help the acquisition workforce understand AAF pathway requirements at the DOD level. Most program officials we spoke to from the selected programs stated that the DAU training was sufficient to learn about the AAF pathways. DAU officials stated that their training courses discuss the AAF at a higher level than the other resources available on their website, which provide more detailed guidance for each pathway. Appendix II provides publicly available resources pertaining to the AAF or one of the four pathways that directly relate to weapon systems.[12]

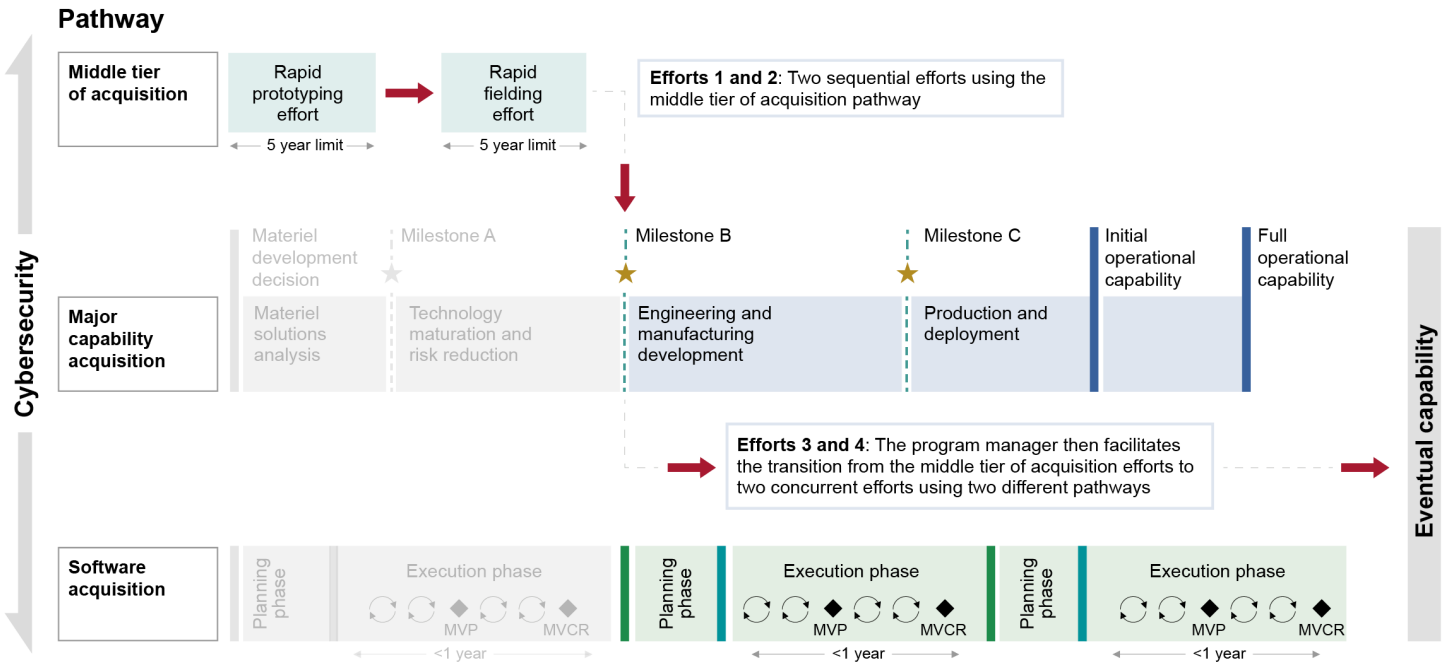
Military Departments Have Various Approaches to Pathway Implementation Via Policy Content, Guidance, and Training

We found that the military departments also took a range of specific steps to implement the AAF. For example, the Army was the only department to describe in its policy operationalizing the AAF how to combine multiple pathways on an individual program to provide value not otherwise available using a single pathway.[13] Figure 8 shows a notional illustration of how programs can use multiple pathways.

[12]DAU courses can be found at https://www.dau.edu/courses.

[13]Department of the Army, *Army Operation of the Adaptive Acquisition Framework*, Army Regulation 70-1 (Washington, D.C.: Nov. 23, 2023).

Figure 8: Illustrative Example of How a Program Can Use Multiple Adaptive Acquisition Framework Pathways



MVCR = Minimum viable capability release
MVP = Minimum viable product

Source: GAO analysis of Department of Defense documentation. I GAO-25-107003

The Army's policy outlines requirements for program managers seeking to use a combination of acquisition pathways, such as the level of senior leadership approval needed. Officials from one of the Army programs we interviewed—the Robotic Combat Vehicle program—stated they used the software and MTA rapid prototyping pathways concurrently for its software and hardware development. Program officials noted that this hybrid approach allowed faster movement through key milestone decisions.

In another example, the Air Force adapted an MTA transition plan template in November 2023 based on a template that DOD originally issued in February 2023 and hosted on the DAU website.[14] This template encouraged program managers to describe how their MTA program

[14]Defense Acquisition University, "Transition Plan Template" (Fort Belvoir, VA.: February 2023), accessed May 3, 2024, https://www.dau.edu/sites/default/files/2024-01/MTA%20-Transition%20Plan%20Template%20%2801292024%29.pdf.

planned to transition either to another pathway or to operational use. Additionally, if a program planned to transition to an operational capability with no further development or procurement, the template called for the program to describe implementation steps such as any necessary sustainment and maintenance for the system. The Air Force added a section listing the documentation that may be required following transition and changed the template to a more easily editable format. Officials from one program we spoke with noted that although they satisfied the MTA pathway requirements through a combined strategy document, when transitioning from the MTA to the MCA pathway they were required to use stand-alone documents after transitioning. As a result, program staff had to duplicate already completed content. The template has the potential to address challenges noted by program officials when transitioning between pathways, such as duplication of document requirements.

Finally, selected program officials generally rely on DAU for overall AAF-related training and other reference materials, such as documentation requirements for different pathways and guidance on selecting, using, and tailoring the pathways. Officials from multiple programs across the military departments also noted specific training and other resources that helped in their implementation of certain pathways. For example, Maritime Tactical Command and Control (MTC2) program officials told us they took Agile software training from an open-source software company, as well as associated NavalX training offered through the Office of Naval Research.[15] For the Air Force's F-22 program, officials told us they took training on the Scaled Agile Framework to learn about Agile methodologies. The framework is intended to provide a scalable and flexible governance framework that defines roles, artifacts, and processes for Agile software development across all levels of an organization. Finally, Army officials from the Maneuver Short Range Air Defense Increment 3 program told us that, prior to pathway selection, the program worked with consultants from DAU to identify what approach made most sense for the program. DAU facilitated the conversations, and the program used the DAU consultants' expertise to shape the program.

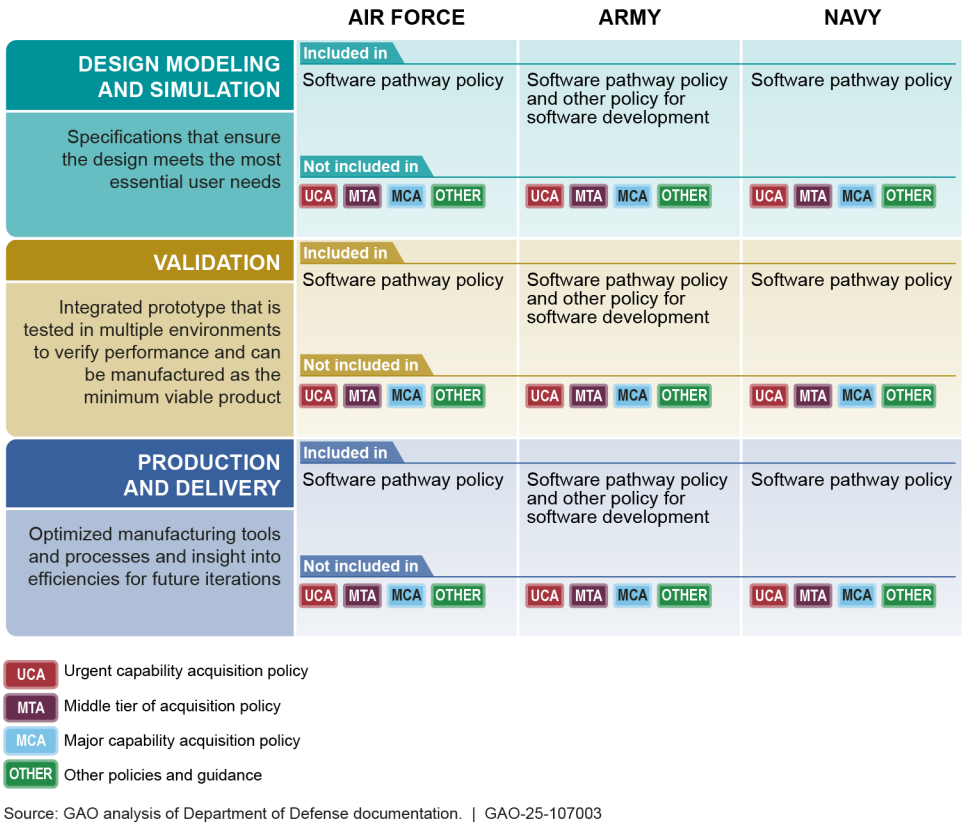
[15]NavalX provides training on topics including using Agile product development strategies.

Military Departments' Approaches Do Not Consistently Reflect Leading Practices for Facilitating Speed and Innovation in Acquisition

Military department policies for the software acquisition pathway included an iterative development structure intended to facilitate speed and innovation. However, neither their policies nor guidance for the other pathways included this structure. Additionally, officials for the programs we reviewed did not consistently demonstrate a clear understanding of how to implement iterative development in their efforts, which may cause them to miss opportunities to deliver capabilities with speed and innovation.

Leading companies use the iterative cycles of design, validation, and production to gain relevant knowledge about the capability under development. See figure 9 for a summary of the extent to which military department policies and guidance discuss the ability to gain this knowledge.

Figure 9: Knowledge Gained during Iterative Cycles in Military Department Policies and Guidance



Source: GAO analysis of Department of Defense documentation. | GAO-25-107003

Note: We considered the knowledge gained to be included in a policy or guidance document only if the full cycle of design modeling and simulation, validation, or production and delivery was present in the document.

Military Departments' Software Pathway Policies Reflect Leading Practices for Facilitating Speed and Innovation

We found that the software acquisition pathway policies issued by the military departments reflected an iterative development structure. This structure includes continuous cycles of design, validation, and production. We have previously found that leading companies use these iterative cycles to deliver complex cyber-physical products with speed and innovation.[16]

Specifically, we found that the military department policies for the software acquisition pathway allowed for programs to identify a minimum viable product and incorporate end-user feedback throughout the process. The policies instruct programs to use this feedback to refine and deploy capabilities and to assess user needs at least annually. Leading companies use ongoing user feedback after the first delivery of a capability to iterate and develop new features, continuing the iterative cycles and deliveries as many times as a product requires. While all the military department software acquisition pathway policies included an iterative development structure, each emphasized some different aspects of iterative development. For example:

- The Air Force policy discussed conducting ongoing assessments of fielded software to determine the value of the investment from an end-user perspective.
- The Army directive on software acquisitions released in March 2024 addressed contracting strategies and funding sources to facilitate iterative approaches.
- The Navy policy defined parameters beyond which programs may not use the software pathway, including where there is a lack of identified value based on user feedback.

This finding regarding the inclusion of iterative development in military department software policies is consistent with our past work regarding DOD's software pathway policy. For example, our leading practices work has previously identified that DOD's software pathway policy included aspects of an iterative development approach.[17] This policy included requirements for the use of modern iterative software development

[16]GAO-23-106222.

[17]GAO-22-104513

methodologies, such as Agile. In addition, the policy required the use of modern tools, techniques, and human-centered design processes to iteratively deliver software to meet user priority needs. In July 2023, we found that DOD developed streamlined requirements processes and documentation to support Agile development for software programs.[18] These documents were tailored to identify high-level needs while allowing for flexibility as detailed requirements evolved—traits generally consistent with leading practices.

Approaches to Acquire Cyber-Physical Capabilities Have Yet to Reflect Leading Practices for Facilitating Speed and Innovation

While we found elements of iterative development for the UCA, MTA, and MCA pathways in the military department policies and guidance we reviewed, we did not find evidence of a full structure of iterative development. Leading practices for developing complex cyber-physical products suggest that programs should use an iterative development structure and continuous cycles of design, validation, and production. Military department officials stated that they use informal approaches such as verbal or email communication to implement iterative development structures for cyber-physical products. This differs from their approach to the software pathway, where the departments include such structures in policy. Officials further explained that policy updates are time consuming, and that they prefer to wait for DOD-level updates to occur before they make policy changes at the military department level. For example, Army officials noted that they can issue guidance more quickly and frequently than the cycle of policy updates to address policy gaps. Without either policy or guidance on fully incorporating iterative development, however, the military departments may limit their ability to take advantage of iterative development cycles, such as by not identifying a minimum viable product that will meet user needs quickly.

Military Department Pathway Policies

We found some elements of iterative development in military department policies for the UCA, MCA, and MTA pathways. However, these policies did not discuss the full structure of iterative development that includes continuous cycles of design, validation, and production resulting in a minimum viable product. Without the full structure, programs will likely not achieve the full benefits of using an iterative approach to design and development.

UCA. We identified refining requirements as part of a rapid process to deliver capabilities in both the Air Force and Navy UCA pathway policies.

[18]GAO, *Defense Software Acquisitions: Changes to Requirements, Oversight, and Tools Needed for Weapon Programs,* GAO-23-105867 (Washington, D.C.: July 20, 2023).

However, we did not find that these policies included information on applying user feedback to refine requirements or ensure the design met the most essential user needs. Leading practices indicate that user feedback is part of each of the iterative cycles, and leading companies use this feedback to refine specifications and design a minimum viable product.

MCA. We found that the military departments also varied in the inclusion of iterative development elements in their MCA pathway policies. We found elements of iterative development only in the Air Force policy. For example, the policy recognized that the acquisition strategy may evolve over time and should include a program's plans for implementing digital engineering. But the policy did not discuss how programs should use digital engineering as part of a structure for iterative development. Digital engineering is a type of modern design tool that enables a virtual representation of a physical product. Such digital models can be tested with users in the digital environment to gauge design performance and refine specifications. Leading companies use digital engineering during design modeling and simulation, especially to quickly determine the most optimal design of a product that meets users' needs.

MTA. We identified that the military departments varied in the inclusion of iterative development elements in their MTA pathway policies. The Air Force encouraged the use of digital engineering and tying capability requirements to operational needs, and the Army policy identified that programs may make trade-offs among requirements to meet the goals of the MTA pathway. While these are all positive elements to include in policy, we did not find that the military departments incorporated them as part of an overall iterative structure, which would ensure the design meets the most essential user needs or test a prototype to verify its performance and identify a minimum viable product. As a result, programs risk using these elements in a linear development structure instead of an iterative development structure, limiting their ability to achieve speed and innovation.

As discussed previously, officials from the Office of the Under Secretary of Defense for Acquisition and Sustainment anticipate the MCA and MTA policies will be issued by January 2025. Until DOD issues the policies, we cannot determine whether these updates incorporate all the information on continuous iterative cycles of design, validation, and production. However, DOD officials stated that, while DOD updates its policies, the military departments can—and should—continue to issue policy and guidance as they see fit.

Military Department Non-Pathway Policies

We found some elements of iterative development in sections of military department policies that were not pathway specific, which the military departments identified as being both relevant to acquisition under the AAF and that may include elements of a structure for iterative development. However, these policy sections did not include the full structure for an iterative approach to design and development that ensures the product design meets the most essential user needs, tests an integrated prototype to verify performance and identify the minimum viable product, and optimizes manufacturing tools and processes to gain insight into efficiencies for future iterations.

The Air Force Integrated Life Cycle Management policy included an explanation of validation as part of the systems engineering technical process. The policy stated that validation provided objective evidence that the system met user capability needs and achieved its intended use in its operational environment. Validation is one of the iterative cycles found in leading practices but is just a part of the continuous cycles that also include design modeling and simulation, and production and delivery. Leading companies use all three cycles to increase knowledge about a system's design, which leads to the identification of a minimum viable product and efficient production of future iterations. Additionally, a pamphlet that provides implementing guidance for this policy provides detail on incremental development, which is defined as an evolutionary process where a desired capability is identified, an end state requirement is known, and that requirement is met over time by developing several increments. However, by already identifying the end state from the start, a program may miss the chance to identify a minimum viable product with a design that meets user needs. In addition, such a program may miss the opportunity to adapt and iterate on the product in response to changes in user needs or advancements in technology.

The Navy's AAF policy section on systems engineering stated that, for all acquisition programs, the program manager should ensure opportunities for digital systems engineering approaches. These approaches can include model-based systems engineering. The Army directive for digital engineering also states that digital engineering should be broadly adopted. Doing so can fully realize the benefits of digital engineering throughout a program's life cycle, such as the ability for users to model requirements trade-offs and assess their impacts. But the directive does not specifically require that product design meets end user needs or that programs identify a minimum viable product. While digital engineering is important, in leading practices it is an enabler for successful iterative development and not necessarily a stand-alone activity. Within the

continuous cycles, digital engineering tools can be used to help stakeholders make decisions based on real-time information to ensure that programs are on track to meet the right requirements.

Weapon System Acquisition Programs

Officials for the nine programs we reviewed did not consistently demonstrate a clear understanding of how to implement iterative development in practice, partially due to misconceptions about iterative development. Some program officials stated that they did not use all elements of iterative development because they did not think they applied to or were feasible for the program. For example, several programs that we spoke to said the processes for iterative development were not applicable to their program's mature technologies or to their rapid fielding efforts because of limited need for technology development. However, mature technologies may already be closer to a minimum viable product, which could allow programs to then focus on efforts to iterate and improve on that capability.

Program officials also described perceived challenges in implementing iterative development practices. Officials from one program stated that they did not use iterative development approaches because of the long lead-time needed to develop certain components. Several programs explained that some modern design tools, like digital twinning, can be costly for them to use for design modeling and simulation. One program shared that iterative development for hardware is challenging. However, we previously found that leading companies apply continuous cycles of development to both hardware and software elements of cyber-physical systems to meet user needs.[19] They continue this work through all phases of product development from design through the maturing of the capability, continuously seeking feedback to further improve the product. Additionally, the use of modern design tools can help programs avoid costly changes later in product development.

Additionally, officials from multiple programs in our review stated that they identified a minimum viable product or had off-ramped capabilities to meet schedule goals.[20] However, these program officials did not consistently demonstrate a clear understanding of how to conduct these activities in line with continuous cycles of iterative development. For example, officials with one program stated that they consider the system

[19]GAO-23-106222.

[20]Off-ramping is a term used by leading companies for removing a capability from a planned release.

itself to be the minimum viable product and chose not to iterate on the baseline capability due to funding restrictions. Officials with another program described off-ramping some capabilities to meet schedule needs. However, they stated that there are no plans to reintroduce off-ramped capabilities in a future iteration, and that the off-ramping did not result in the program delivering capabilities to users early. Officials with a third program stated that they off-ramped capabilities, but this decision was based on schedule considerations, not immediate user needs.

Leading companies create a minimum viable product to have an initial set of capabilities delivered to users with speed that can then be followed by successive updates. Each of the iterative cycles helps to identify what the minimum viable product is based on user feedback and knowledge gained to refine the capability. Programs can also off-ramp technologies that are less mature to achieve speed in delivering a minimum viable product to users based on immediate needs. Because the iterative process allows for continuous iteration over multiple cycles, programs may reintroduce off-ramped capabilities in future iterative product deliveries.

Further, two of the programs in our review stated that they incorporated end user and test and evaluation feedback during the design process. However, these programs did not demonstrate that this feedback informed improvements to a minimum viable product or whether the programs could use the feedback to identify new features that could be included in subsequent iterations or new products. For example, officials with one program noted that they used warfighter feedback to address user needs, such as improving the ergonomics of the system. However, officials shared that they do not currently have a minimum viable product, nor do they plan to identify one. Additionally, they stated that user feedback only enables updates to the system within the existing set of requirements, rather than helping identify new features. Officials with a second program explained that they received test data for design modeling and simulation from another office in the military department, and they used simulators to gain early input from end users. While the program found this feedback helpful, officials stated they were not using an iterative development process, whereby such feedback would inform improvement on a minimum viable product.

In leading practices, continuous user feedback underpins all the steps of the iterative cycle. Leading companies use this feedback to help design the minimum viable product, validate that the minimum viable product

meets user needs, and identify improvements and new features for future iterations of the capability.

In our June 2024 annual weapon systems assessment, we found that DOD remains alarmingly slow in delivering new and innovative weapon system capabilities, even as national security threats continue to evolve.[21] While DOD made efforts to implement flexibility through the AAF, we found that the average expected time for major capabilities that have yet to deliver in DOD's portfolio to deliver even an initial capability to the warfighter is 10 years. This time frame is incompatible with maintaining military advantage in an environment shaped by the need for technological advantage. Additionally, as part of that analysis, the MTA programs we reviewed that intend to transition to the MCA pathway at development start plan to take an average of 10 years after the start of the MTA effort to deliver initial capability to the warfighter.

We previously found that many weapon system acquisition programs included in our June 2024 report do not plan to fully implement the cycles of iterative development that correspond to an iterative development structure.[22] For example, we found that only five of the 25 programs included in that report's analysis stated they would use design modeling and simulation to ensure the design met essential user needs. Further, only 13 said they would conduct validation to verify the minimum viable product. Finally, only six said they would use production and delivery to identify efficiencies and prepare for the next iteration of the capability. Furthermore, while two out of the 20 MTA programs that we analyzed reported using all the practices in each of the three iterative development cycles, several programs included in that analysis reported challenges to employing iterative development. These challenges were due to complications in ensuring open, adaptable, and secure digital engineering tools; and difficulty ensuring user and stakeholder involvement.

Based on our current review of relevant documentation and discussions with officials from our selected programs, the military departments have not provided programs with any practical examples of non-software programs that had fully incorporated an iterative development structure. Such examples of programs that fully incorporate an iterative development structure could serve as a model for current and future programs to learn from and emulate. Selected program officials described

[21]GAO-24-106831.

[22]GAO-24-106831.

instances in which they sought lessons learned in other contexts, such as streamlining documentation or preparing for transition out of the MTA pathway. We found that pilot programs can be an effective tool for informing decisions on how to implement new approaches—such as leading practices for product development—where it is not clear how to proceed.[23] We also previously reported that an effectively designed pilot program considers how well lessons learned can be applied to other, broader settings. To assess scalability, criteria for identifying these lessons learned should relate to the similarity or comparability of the pilot to the range of circumstances and population expected in full implementation.[24]

Without policies or guidance on how programs can use a structure for iterative development and continuous cycles of design, validation, and production, programs across pathways are not incorporating iterative development to the extent possible. This results in missed opportunities to deliver capabilities with speed and innovation. Further, a well-designed pilot program could provide programs with practical examples that yield lessons learned, as well as identifying additional training, resources, and policy or guidance that are needed to fully leverage these approaches and achieve speed and innovation.

Conclusions

DOD's efforts to increase the speed of delivery to the warfighter have yet to improve average delivery time for weapon system acquisitions. We reported on how leading companies use iterative development cycles to deliver complex cyber-physical products with speed, but the military

[23]For more information, see GAO, *Highway Infrastructure: Better Alignment with Leading Practices Would Improve DOT's Reconnecting Communities Pilot Program*, GAO-23-105575 (Washington, D.C. May 24, 2023); *Climate Change: A Climate Migration Pilot Program Could Enhance the Nation's Resilience and Reduce Federal Fiscal Exposure*, GAO-20-488 (Washington, D.C.: July 6, 2020); and *Data Act: Section 5 Pilot Design Issues Need to Be Addressed to Meet Goal of Reducing Recipient Reporting Burden*, GAO-16-438 (Washington, D.C.: Apr. 19, 2016). GAO has identified five leading practices for effective pilot design. First, establish well-defined, appropriate, clear, and measurable objectives. Second, clearly articulate assessment methodology and data gathering strategy that addresses all components of the pilot program and includes key features of a sound plan. Third, identify criteria or standards for identifying lessons about the pilot to inform decisions about scalability; and whether, how, and when to integrate pilot activities into overall efforts. Fourth, develop a detailed data-analysis plan to track the pilot program's implementation and performance and evaluate the final results of the project; and draw conclusions on whether, how, and when to integrate pilot activities into overall efforts. Fifth, ensure appropriate two-way stakeholder communication and input at all stages of the pilot project, including design, implementation, data gathering, and assessment.

[24]GAO-16-438.

departments have yet to fully incorporate those practices into policy or guidance. While the military departments have provided resources on how to use a structure for iterative development for programs on the software pathway, they have yet to provide other pathway or non-pathway policies or guidance for programs to use these practices in developing weapon systems.

DOD is currently revising some of its acquisition policies that may introduce these practices more broadly. However, this does not preclude the military departments from developing their own policies and guidance to facilitate gaining the knowledge that comes from iterative development cycles in the meantime. While the updated policies may authorize the use of iterative development practices, guidance and the lessons learned from the experiences of others may help change behavior. Well-developed pilot programs could give program officials across the military departments examples to learn from and increase their understanding to achieve speed and innovation to deliver capabilities faster to the warfighter.

Recommendations for Executive Action

We are making six recommendations: two each to the Air Force, Army, and Navy.

The Secretary of the Air Force should revise its acquisition policies and relevant guidance to reflect leading practices that facilitate speed and innovation, using continuous iterative cycles that ensure the design meets user needs, the development of a minimum viable product, and the optimization of processes to produce further iterations. (Recommendation 1)

The Secretary of the Army should revise its acquisition policies and relevant guidance to reflect leading practices that facilitate speed and innovation, using continuous iterative cycles that ensure the design meets user needs, the development of a minimum viable product, and the optimization of processes to produce further iterations. (Recommendation 2)

The Secretary of the Navy should revise its acquisition policies and relevant guidance to reflect leading practices that facilitate speed and innovation, using continuous iterative cycles that ensure the design meets user needs, the development of a minimum viable product, and the optimization of processes to produce further iterations. (Recommendation 3)

The Secretary of the Air Force should designate one or more new cyber-physical capabilities as pilot programs that provide lessons learned on using leading practices to facilitate speed and innovation for programs on each acquisition pathway directly related to weapon systems. (Recommendation 4)

The Secretary of the Army should designate one or more new cyber-physical capabilities as pilot programs that provide lessons learned on using leading practices to facilitate speed and innovation for programs on each acquisition pathway directly related to weapon systems. (Recommendation 5)

The Secretary of the Navy should designate one or more new cyber-physical capabilities as pilot programs that provide lessons learned on using leading practices to facilitate speed and innovation for programs on each acquisition pathway directly related to weapon systems. (Recommendation 6)

Agency Comments and Our Evaluation

We provided a draft of this product to DOD for comment. In its written comments, reproduced in appendix III, DOD concurred with recommendations 1, 3, 4, and 6, and partially concurred with recommendations 2 and 5.

DOD noted that the Air Force and Navy concurred with recommendations 1 and 3, which recommended that the departments revise their acquisition policies and relevant guidance to reflect leading practices that facilitate speed and innovation. In its explanation as to why the Army partially concurred with recommendation 2, DOD noted that the Army agreed with this recommendation for all pathways except for the UCA pathway because the UCA pathway intends to deliver capabilities as quickly as possible to address urgent or emerging operational needs, and that these capabilities should not require substantial development. DOD further stated that the Army believes that it can better consider iterative design approaches for programs on the UCA pathway that transition to another pathway after successfully addressing an urgent or emerging operational need.

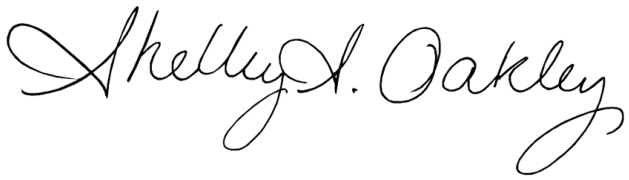
We maintain that there are elements of leading practices that are applicable to programs on the UCA pathway, such as applying user feedback to ensure the capability meets those urgent or emerging needs. Having these leading practices reflected in acquisition policies and relevant guidance will help ensure programs across pathways incorporate iterative development to the greatest extent possible.

Similarly, DOD noted that the Air Force and Navy concurred with recommendations 4 and 6, which recommended that they designate one or more new cyber-physical capabilities as pilot programs that provide lessons learned on using leading practices to facilitate speed and innovation. In its explanation as to why the Army partially concurred with recommendation 5, DOD stated that the Army will identify select programs applying leading practices of iterative design under the other three pathways; however, the Army views the UCA pathway as uniquely intended to deliver capabilities as rapidly as possible and with minimal development required.

The intent of our recommendation is not that the Army identify pilot programs on each of the pathways. Rather, it is for the lessons learned from the pilot programs—regardless of their pathway—to be absorbed by programs across all pathways, to the extent possible and applicable.

We are sending copies of this report to the appropriate congressional committees; the Secretary of Defense; and the Secretaries of the Army, Navy, and Air Force. In addition, this report is available at no charge on the GAO website at https://www.gao.gov

If you or your staff have any questions concerning this report, please contact me at (202) 512-4841 or oakleys@gao.gov. Contact points for our offices of Congressional Relations and Public Affairs may be found on the last page of this report. Staff members making key contributions to this report are listed in appendix IV.



Shelby S. Oakley,
Director, Contracting and National Security Acquisitions

List of Committees

The Honorable Jack Reed
Chairman
The Honorable Roger Wicker
Ranking Member
Committee on Armed Services
United States Senate

The Honorable Jon Tester
Chair
The Honorable Susan Collins
Ranking Member
Subcommittee on Defense
Committee on Appropriations
United States Senate

The Honorable Mike Rogers
Chairman
The Honorable Adam Smith
Ranking Member
Committee on Armed Services
House of Representatives

The Honorable Ken Calvert
Chairman
The Honorable Betty McCollum
Ranking Member
Subcommittee on Defense
Committee on Appropriations
House of Representatives

Appendix I: Objectives, Scope, and Methodology

This report (1) describes how the military departments implemented the Adaptive Acquisition Framework (AAF) to align with the Department of Defense's (DOD) strategic goals and policies, and (2) assesses the extent to which the military departments' approaches to implementing the acquisition framework reflect leading practices for facilitating speed and innovation in acquisition.

For both objectives, we focused our review on the four pathways of the AAF directly relevant to developing weapon systems:

1. Urgent Capability Acquisition;
2. Middle Tier of Acquisition;
3. Major Capability Acquisition; and
4. Software Acquisition.

In addition, we selected a nongeneralizable sample of nine ongoing weapon system acquisition programs as illustrative examples to examine the military departments' approaches to implementing the AAF. We planned for a distribution of programs between the three military departments: Air Force (including the Space Force), Army, and Navy (including the Marine Corps). To identify ongoing programs, we used data from the Defense Acquisition Visibility Environment, the primary DOD resource for acquisition related data, to identify programs that had expended less than 90 percent of their funding as of October 2023. We narrowed these results to at least one program from each of the relevant pathways, as represented in the data.[1]

We chose both the planning and execution phases for the Middle Tier of Acquisition pathway, including programs at different points in their life cycle. For the Major Capability Acquisition pathway, we included programs in the technology maturation and risk reduction and engineering and manufacturing development phases as they are relatively earlier acquisition phases and, therefore, less likely to have been operational prior to establishment of the AAF. We included major capabilities

[1]This source identified Iron Fist Light Decoupled as an Urgent Capability Acquisition. Officials from this program noted that it began prior to the Adaptive Acquisition Framework as an engineering change proposal to an existing MCA program under an urgent material release effort. However, for the purposes of representation in the Defense Acquisition Visibility Environment, they determined Urgent Capability Acquisition to be the best pathway fit for the program. Army officials subsequently stated that a better alignment would be as a Major Capability Acquisition, with elements of rapid prototyping and rapid fielding.

designated as Acquisition Category IB, IC, or ID, which represent the most expensive major defense acquisitions.

We received a list of software programs from DOD that, according to DOD officials, would be more authoritative than such a list generated using data from the Defense Acquisition Visibility Environment. We then gathered information on each program including acquisition pathway and acquisition phase. We reviewed recently completed and ongoing GAO reviews to identify potential constraints associated with selection of a particular program for a publicly available report, such as the level of classification of associated documentation. We selected programs to achieve a balance of factors including military department and acquisition pathway. We interviewed program officials from each of the selected programs and reviewed available strategy documentation to understand their implementation of the AAF and approaches to iterative development.

We interviewed the following acquisition policy offices of the Air Force, Army, Navy, and DOD to identify the policies and guidance that operationalize these pathways and the AAF:

- Assistant Secretary of the Air Force for Acquisitions, Technology and Logistics;
- Assistant Secretary of the Air Force for Space Acquisition and Integration;
- Assistant Secretary of the Army for Acquisition, Logistics and Technology;
- Assistant Secretary of the Navy for Research, Development and Acquisition;
- Marine Corps Systems Command;
- Office of the Under Secretary of Defense for Acquisition and Sustainment; and
- Defense Acquisition University

To describe how the military departments implemented the AAF, we identified the acquisition-related goals from the 2022 National Defense Strategy. We reviewed those policies identified by the military departments to describe how they aligned with those identified goals as well as to determine steps taken to implement the AAF. Two analysts reviewed the policies and noted any disagreements for a third analyst to reconcile. The policies we reviewed for the military departments include:

Air Force

- Department of the Air Force, *Operation of the Middle Tier of Acquisition*, Air Force Instruction 63-146 (Washington, D.C.: May 7, 2021).
- Department of the Air Force, *Urgent Capability Acquisition*, Air Force Instruction 63-147 (Washington, D.C.: Feb. 4, 2021).
- Department of the Air Force, *Major Capability Acquisition*, Air Force Instruction 63-151 (Washington, D.C.: Aug. 19, 2022).
- Department of the Air Force, *Operation of the Software Acquisition Pathway*, Air Force Instruction 63-150 (Washington, D.C.: Aug. 11, 2021).
- Department of the Air Force*, Integrated Life Cycle Management*, Air Force Instruction 63-101/20-101 (Washington, D.C.: Feb. 16, 2024).
- Department of the Air Force, *Integrated Life Cycle Management*, Air Force Pamphlet 63-128 (Washington, D.C.: Feb. 3, 2021).
- Department of the Air Force, Assistant Secretary of the Air Force for Acquisition, Technology and Logistics, *Air Force Guidance Memorandum for the Acquisition Enterprise on Digital Building Code for the Transformation of Acquisition and Sustainment* (Washington, D.C.).
- Department of the Air Force, Assistant Secretary of the Air Force for Acquisition, Technology and Logistics, *Air Force Guidance Memorandum for Rapid Acquisition Activities*, AFGM 2018-63-146-01 (Washington, D.C.: June 13, 2018).
- Department of the Air Force, *Transition Plan Template v4*.

Army

- Department of the Army, *Army Operation of the Adaptive Acquisition Framework*, Army Regulation 70-1 (Washington, D.C.: Nov. 28, 2023).
- Department of the Army, *Enabling Modern Software Development Acquisition Practices*, Army Directive 2024-02 (Washington, D.C.: Mar. 11, 2024).
- Department of the Army, *Army Digital Engineering*, Army Directive 2024-03 (Washington, D.C.: May 21, 2024).

Navy

- Department of the Navy, Secretary of the Navy, *Implementation of the Defense Acquisition System and the Adaptive Acquisition Framework*, Navy Instruction 5000.2G (Washington, D.C.: Apr 8. 2022).

To assess the extent to which the departments' approaches to implementing the AAF reflect leading practices, we reviewed our prior

work on leading practices.[2] We identified the following key terms to search the military department AAF policies and guidance: iterative, iteration, minimum viable product, minimum viable capability, minimum capability, minimal capability, capability release, capability development, refine, refine requirements, digital thread, end user, user feedback, validate, validation, evolve, evolution, off-ramp, digital engineering, and model. We reviewed the same military department documentation used for the first objective. We searched the policies for these terms and then reviewed the policies to identify synonyms to cover variance of terminology in policy documents.

Two analysts reviewed the results to determine the presence of iterative development cycles in the policies by looking for the specific knowledge to be gained for the various cycles. Design modeling and simulation should result in specifications that ensure the design meets the most essential user needs. Validation should result in an integrated prototype that is tested in multiple environments to verify performance and can be manufactured as the minimum viable product. Production and delivery should result in optimized manufacturing tools and processes to gain insight into efficiencies for future iterations. The analysts noted any disagreements for a third analyst to reconcile. Following this analysis, we met with the acquisition policy offices to discuss our initial analysis and to identify any additional documents to include.

We conducted this performance audit from July 2023 to December 2024 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

[2]GAO, *Leading Practices: Iterative Cycles Enable Rapid Delivery of Complex, Innovative Products*, GAO-23-106222 (Washington, D.C.: July 27, 2023); and *Leading Practices: Agency Acquisition Policies Could Better Implement Key Product Development Principles*, GAO-22-104513 (Washington, D.C.: Mar. 10, 2022).

Appendix II: Adaptive Acquisition Framework Guidance Documents, Resources, and Training Courses

The Air Force, Army, Navy, and Defense Acquisition University (DAU) offer guidance documents, resources, and training courses to learn about the Adaptive Acquisition Framework (AAF). DAU officials we spoke with told us that resources offered by DAU generally support the Department of Defense's acquisition workforce while resources offered by each military department are more specific to their departmental needs.

Table 1 includes a non-exhaustive list of guidance documents and resources with specific sections and application to the four AAF pathways that directly relate to weapon systems. Table 2 includes a non-exhaustive list of training with specific sections and application to the AAF pathways.

Table 1: Adaptive Acquisition Framework (AAF) Guidance Documents and Resources

Source	Guidance Document or Resource
DAU	AAF DOD Quick Reference Card
	Adaptive Acquisition Framework
	Adaptive Acquisition Framework Document Identification
	Mission Assistance
	Selecting and Transitioning Pathways
Air Force	AF/A5R Requirements Development Guidebook, Volume 4: Requirements Activities to Support Modification Proposals
	Memorandum for the Acquisition Enterprise: Digital Building Code for the Transformation of Acquisition and Sustainment
	Air Force Guidance Memorandum for Rapid Acquisition Activities
	Memorandum for the Department of Air Force Space Acquisition Workforce: Three Years or Less from Contract Start to Launch - A Simple Formula to Go Fast in Space Acquisition
	Memorandum for the Department of Air Force Space Acquisition Workforce: Space Acquisition Tenets
	Department of the Air Force Pamphlet 63-128 Integrated Life Cycle Management
	Practical Design of Experiments: Considerations for Iterative Developmental Testing Best Practice
Army	Army Directive 2024-02: Enabling Modern Software Development and Acquisition Practices
	Army Directive 2024-03: Army Digital Engineering

Source: GAO analysis of Department of Defense (DOD) and Defense Acquisition University (DAU) information and agency official interviews. | GAO-25-107003

Note: Web information last accessed August 20, 2024.

Table 2: Adaptive Acquisition Framework (AAF) Training Courses

Source	Training Course
Air Force	SYS 182: Introduction to Systems Engineering
	SYS 281: Air Force Acquisition and Sustainment Course
	SYS 282: Management of the Systems Engineering Process
	SYS 400: Current Topics in Acquisition and Support
	WKSP 0678: Topics in Agile, DevOps, and DevSecOps
	WKSP 0695: Applied Reliability Analysis and Design
Army	U.S. Army Data Driven Leadership Certificate Program. See Custom Leadership Programs, Bootcamps, and Workshops.
	Digital Transformation - Masterclass
	The Agile Samurai Bootcamp
	The Product Management for Artificial Intelligence and Data Science Course
Navy	NavalX Centers for Adaptive Warfighting: Center Design
	NavalX Centers for Adaptive Warfighting: Military Scrum Master Course

Source: GAO analysis of Department of Defense (DOD) information and agency official interviews. | GAO-25-107003

Note: Web information last accessed August 20, 2024.

Appendix III: Comments from the Department of Defense

OFFICE OF THE UNDER SECRETARY OF DEFENSE
3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

ACQUISITION
AND SUSTAINMENT

Ms. Shelby Oakley
Director, Contracting and National Security Acquisitions
U.S. Government Accountability Office
441 G Street, NW
Washington DC 20548

Dear Ms. Oakley,

This is the Department of Defense (DoD) response to the Government Accountability office Draft Report GAO-25-107003 "DoD ACQUISITION REFORM: Military Departments Should Take Steps to Facilitate Speed and Innovation," dated September 20, 2024 (GAO Code 107003).

The Department partially concurs with recommendation 2, regarding revising the Army acquisition policies and guidance to reflect leading practices that facilitate speed and innovation using iterative cycles. The Army agrees with the recommendation for all pathways except for Urgent Capability Acquisition (UCA) because that pathway is designed for delivering urgent or emergent capabilities, and those capabilities should not require substantial development. The Army believes iterative design can be considered when UCA programs transition to another pathway after successfully addressing an urgent or emergent need.

The Department also partially concurs with recommendation 5, that the Secretary of the Army should designate one or more cyber-physical capabilities as pilot programs that provide lessons learned on using leading practices to facilitate speed and innovation for programs on each pathway, for similar reasons as recommendation 2. The Army views the UCA pathway as uniquely intended to deliver capabilities rapidly with minimal development but will select pilot programs under the other pathways and share those examples with Program Executive Offices. A more detailed explanation can be found in our enclosed official written comments.

The Department concurs with recommendations 1, 3, 4, and 6.

The Department appreciates the opportunity to comment on the Draft Final Report. My point of contact for this effort is Ms. Katherine Edgerton, 571-256-1528.

Sincerely,

TENAGLIA.JOHN.M.1154945926
Digitally signed by TENAGLIA.JOHN.M.1154945926
Date: 2024.11.18 11:50:13 -05'00'

John M. Tenaglia
Principal Director,
Defense Pricing, Contracting, and Acquisition Policy

Enclosure:
As stated

GAO DRAFT REPORT DATED SEPTEMBER 20, 2024
GAO-25-10073 (GAO CODE 107003)

"DOD ACQUISITION REFORM: MILITARY DEPARTMENTS SHOULD TAKE STEPS TO FACILITATE SPEED AND INNOVATION"

DEPARTMENT OF DEFENSE COMMENTS
TO THE GAO RECOMMENDATION

RECOMMENDATION 1: The GAO recommends that the Secretary of the Air Force should revise its acquisition policies and relevant guidance to reflect leading practices that facilitate speed and innovation using continuous iterative cycles that ensure the design meets user needs, the development of a minimum viable product, and the optimization of processes to produce further iterations.

DoD RESPONSE: Concur.

RECOMMENDATION 2: The GAO recommends that the Secretary of the Army should revise its acquisition policies and relevant guidance to reflect leading practices that facilitate speed and innovation using continuous iterative cycles that ensure the design meets user needs, the development of a minimum viable product, and the optimization of processes to produce further iterations.

DoD RESPONSE: Partially concur. The Army acknowledges the draft report finds the Army Software Pathway policy incorporates GAO-identified leading practices. The Army revised its Middle Tier policy guidance on 16 August 2024, which now reflects GAO recommendations to incorporate iterative design approaches. The Army will also comply with the update to the DoD 5000.85 for Major Capability Acquisition once published and asses whether any additional Army-level policy or guidance will be required to support compliance. The Army disagrees with the need to incorporate iterative design practices into the Urgent Capability of Acquisition (UCA) pathway. The UCA pathway is fundamentally intended to deliver capabilities as quickly as possible to address urgent or emerging operational needs, and these capabilities should not require substantial development effort. Iterative design approaches can better be considered for UCA that transition to another pathway after successfully addressing an urgent/emergent operational need.

RECOMMENDATION 3: The GAO recommends that the Secretary of the Navy should revise its acquisition policies and relevant guidance to reflect leading practices that facilitate speed and innovation using continuous iterative cycles that ensure the design meets user needs, the development of a minimum viable product, and the optimization of processes to produce further iterations.

DoD RESPONSE: Concur. The Department of the Navy (DON) embraces the concept of iterative development and has been supportive of OSD efforts to capture that more directly in the

DoDI 5000.85 and has begun revising our relevant policy to match. Furthermore, the DON's MTA Implementation Guide (to be released imminently) captures these practices.

RECOMMENDATION 4: The GAO recommends that the Secretary of Air Force should designate one or more new cyber-physical capabilities as pilot programs that provide lessons learned on using leading practices to facilitate speed and innovation for programs on each acquisition pathway directly related to weapon systems.

DoD RESPONSE: Concur.

RECOMMENDATION 5: The GAO recommends that the Secretary of Army should designate one or more new cyber-physical capabilities as pilot programs that provide lessons learned on using leading practices to facilitate speed and innovation for programs on each acquisition pathway directly related to weapon systems.

DoD RESPONSE: Partially concur. The Army views the UCA pathway as uniquely intended to deliver capabilities as rapidly as possible and capability solutions should require minimal development. The Army will identify select programs applying leading practices of iterative design under the MCA, MTA, or SW pathways and share these examples with the Program Executive Offices.

RECOMMENDATION 6: The GAO recommends that the Secretary of Navy should designate one or more new cyber-physical capabilities as pilot programs that provide lessons learned on using leading practices to facilitate speed and innovation for programs on each acquisition pathway directly related to weapon systems.

DoD RESPONSE: Concur. The DON believes that there are already examples of programs that have embraced the identified leading practices. The DON will capture those lessons learned and analyze whether those programs' experiences are sufficient, or whether formal pilots will be established.

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

Shelby S. Oakley, (202) 512-4841 or oakleys@gao.gov

Staff Acknowledgments

In addition to the contact named above, the following staff members made key contributions to this report: Robert Bullock (Assistant Director), Cale Jones (Analyst-in-Charge), Vinayak K. Balasubramanian, Macie Benincasa, Shelby Clark, Lorraine Ettaro, Dinah Girma, Laura Greifner, Royal Srem-Sai, and Adam Wolfe.

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Strategic Planning and External Liaison

Stephen J. Sanford, Managing Director, spel@gao.gov, (202) 512-4707 U.S. Government Accountability Office, 441 G Street NW, Room 7814, Washington, DC 20548