

# DOD Current and Planned Software Modernization Efforts



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Presented by:

Andrew Burton, Senior Analyst

GAO Contracting and National Security Acquisitions Team



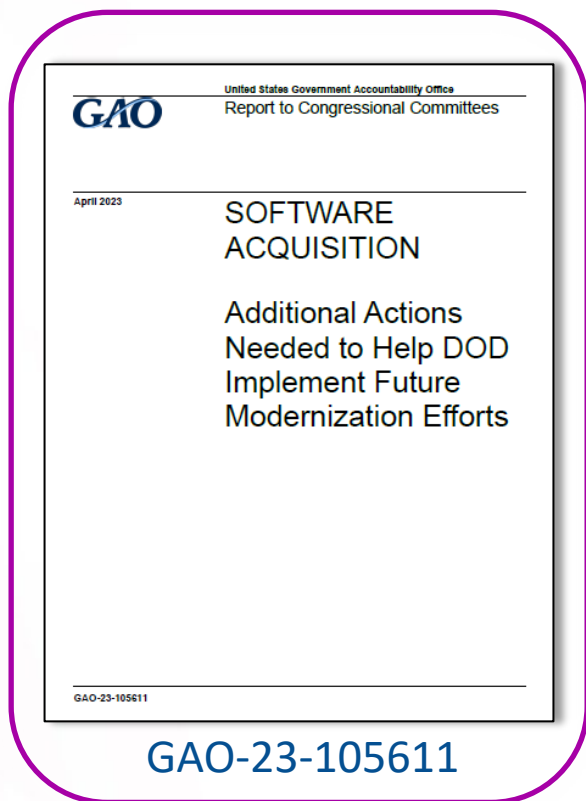
## DOD Imperative

“The Department of Defense’s (DOD) capacity to respond to evolving threats and compete with strategic challengers, such as China and Russia, is increasingly determined by its ability to rapidly develop and deploy weapon systems, many with complex software.”



# Origin of the Work and Resultant Reports

## Section 838 of the National Defense Authorization Act for Fiscal Year 2021



United States Government Accountability Office  
Report to Congressional Committees

GAO

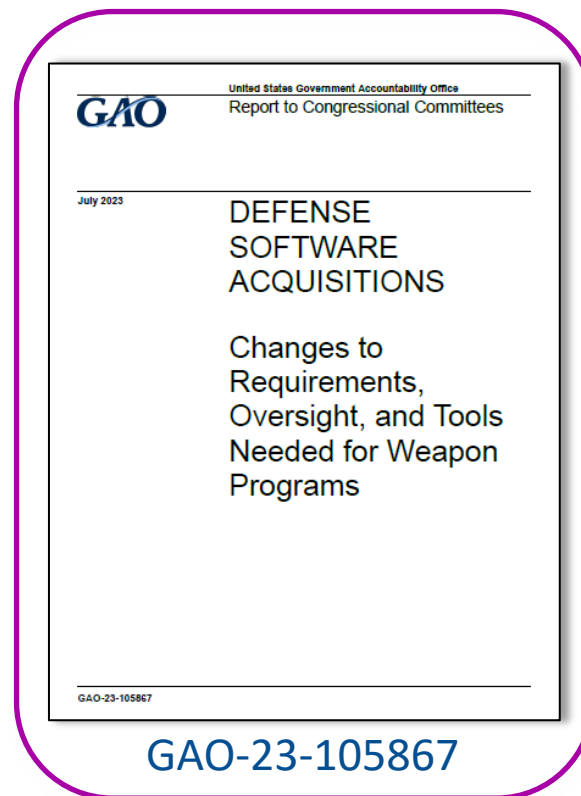
April 2023

**SOFTWARE  
ACQUISITION**

Additional Actions  
Needed to Help DOD  
Implement Future  
Modernization Efforts

GAO-23-105611

GAO-23-105611



United States Government Accountability Office  
Report to Congressional Committees

GAO

July 2023

**DEFENSE  
SOFTWARE  
ACQUISITIONS**

Changes to  
Requirements,  
Oversight, and Tools  
Needed for Weapon  
Programs

GAO-23-105867

GAO-23-105867



## Research Questions & Scope and Methodology

- The William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 included a provision for GAO assess a broad range of DOD software modernization elements, such as to examine DOD's implementation of Defense Science Board and Defense Innovation Board software modernization recommendations.<sup>1</sup>
- GAO-23-105611 assessed the extent to which DOD implemented the Defense Science Board and Defense Innovation Board recommendations and is positioned to implement future software modernization efforts.
- GAO-23-105867 assessed the extent to which DOD has policy and guidance related to requirements and oversight of Agile processes and enabled the adoption of modern software tools.

### DOD Organizations

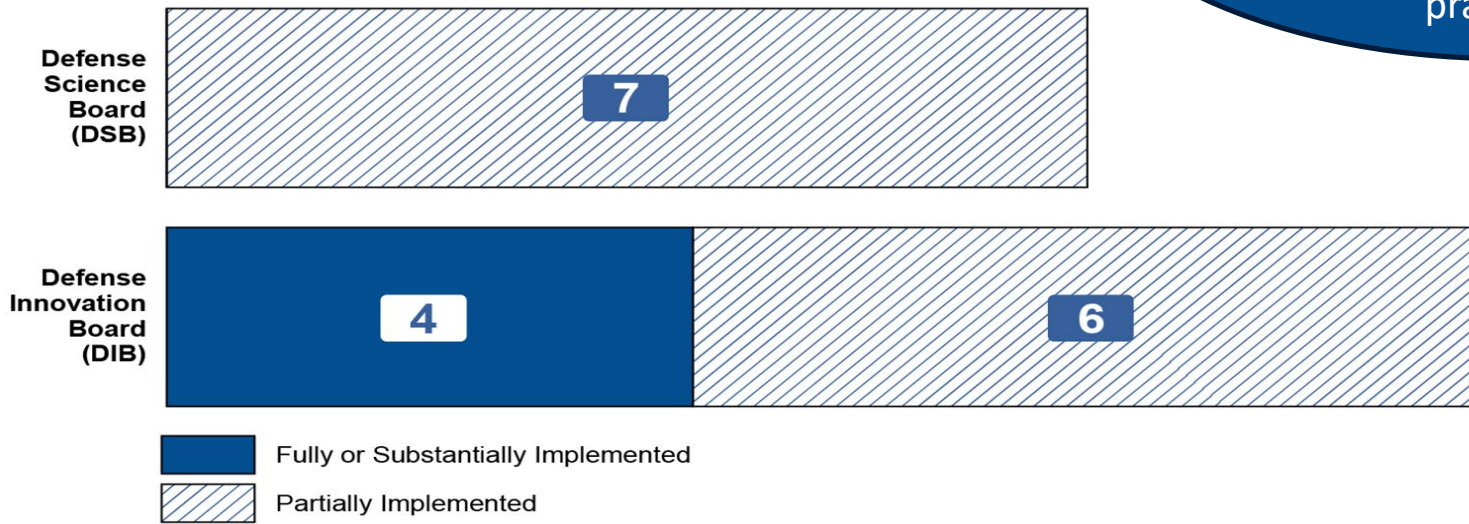


<sup>1</sup>Defense Innovation Board, *Software Is Never Done: Refactoring the Acquisition Code for Competitive Advantage* (May 3, 2019); Defense Science Board, *Final Report of the Defense Science Board Task Force on the Design and Acquisition of Software for Defense Systems* (February 2018).

# Defense Science Board & Defense Innovation Board Recommendations and Implementation

Defense Science Board: “DOD can, and should, leverage commercial software development leading practices to its advantage, including on its weapon systems.”

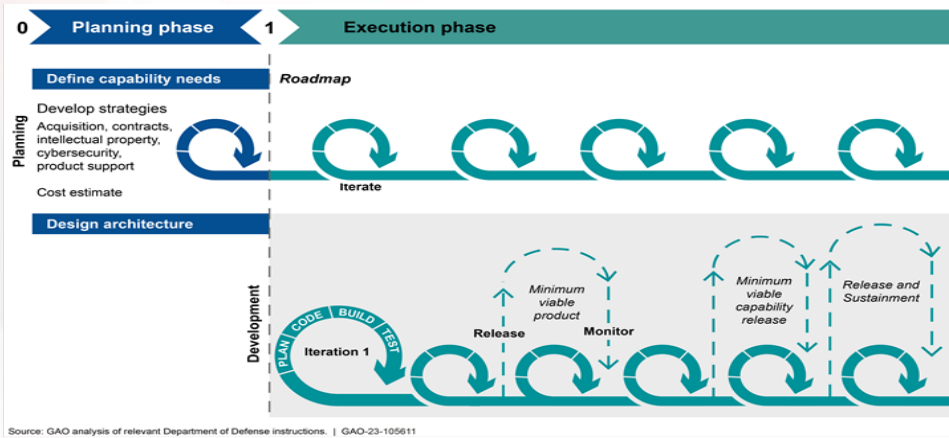
Defense Innovation Board: emphasized the need for DOD to deploy software quickly, focus on continuous improvement throughout the software life cycle, and develop a workforce to follow modern software development practices.



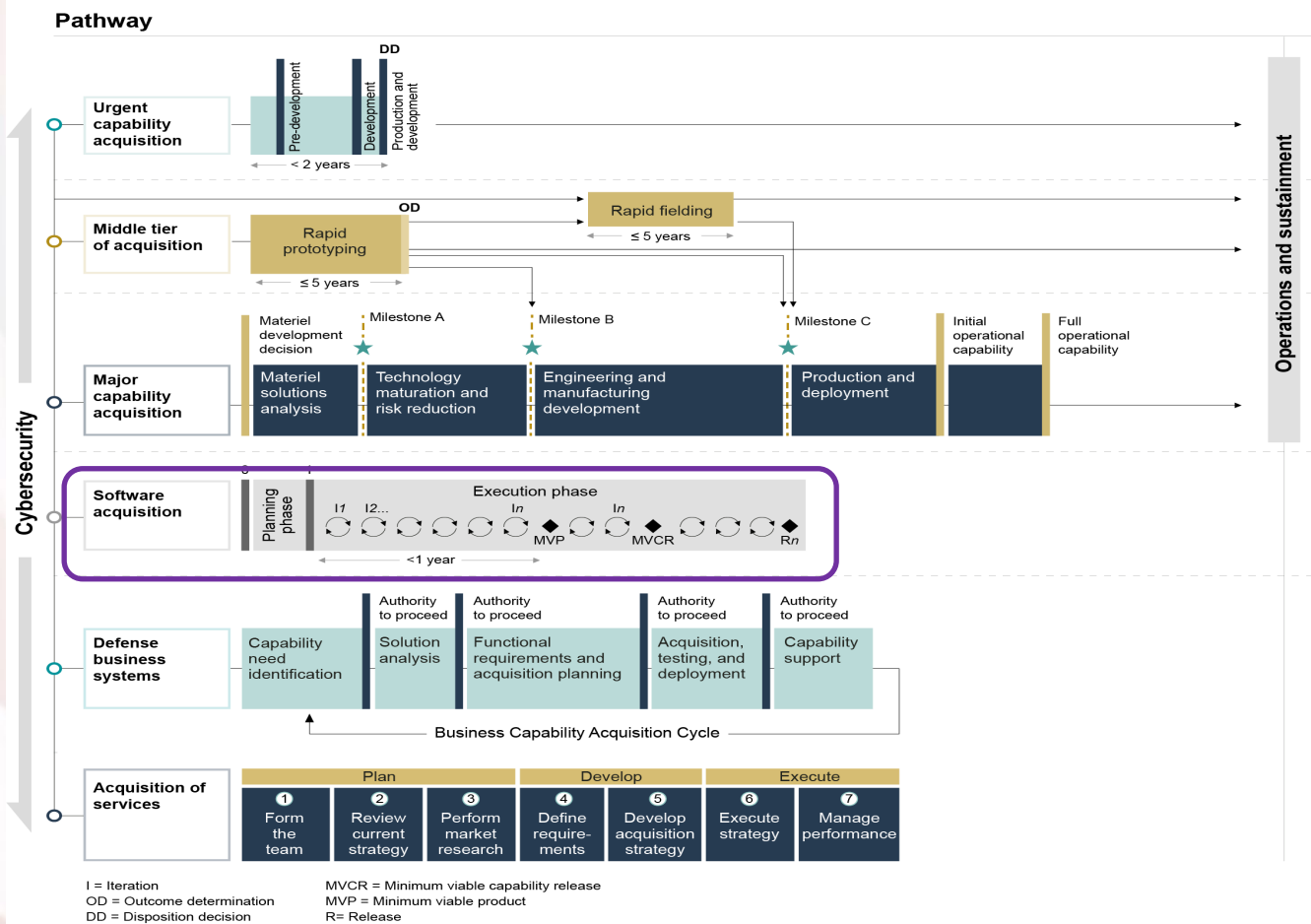
Source: GAO analysis of Department of Defense (DOD) information and interviews with DOD officials. | GAO-23-105611



# DOD Implementation – Successes and Gaps



# DOD Software Development Using DOD Acquisition Pathways (GAO-23-105867)



- GAO's 2023 weapon systems annual assessment showed 44 of 52 weapon programs reported using Agile or other modern software development approaches while on pathways other than the software pathway.
- We found that DOD has not incorporated oversight of Agile software development into acquisition policy and guidance for all programs using Agile.

Source: GAO analysis of Department of Defense (DOD) data. | GAO-23-105611

# DOD's Software Modernization Planning

DOD Digital Modernization Strategy	DOD Software Science and Technology Strategy	DOD Software Modernization Strategy
JULY 2019	NOV. 2021	FEB. 2022
<p><b>Vision</b> Deliver a more secure, coordinated, seamless, transparent, and cost-effective IT architecture that transforms data into actionable information and ensures dependable mission execution in the face of a persistent cyber threat.</p> <p><b>Goals</b> (1) innovate for competitive advantage; (2) optimize for efficiencies and improved capability; (3) evolve cybersecurity for an agile and resilient defense posture; and (4) cultivate talent for a ready digital workforce.</p> <p><b>Intent</b> Provide a roadmap to support the implementation of National Defense Strategy priorities.</p>	<p><b>Vision</b> Deliver resilient software capabilities at the speed of relevance. For instance, modernize development approaches to deliver secure, resilient software capabilities within hours or days rather than months or years.</p> <p><b>Goals</b> (1) incorporate engineering and software development earlier in the acquisition life cycle; (2) adopt an integrated framework of shared resources; (3) transform the software workforce; and (4) align software science and technology with acquisition.</p> <p><b>Intent</b> Address statutory requirements to, among other things, outline a plan to advance and enable the rapid transition of software-developed capabilities to acquisition programs through research and development and science and technology initiatives.</p>	<p><b>Vision</b> Deliver resilient software capability at the speed of relevance. Resilience implies software that is high-quality to produce a portfolio of software capabilities enabled by DOD processes.</p> <p><b>Goals</b> (1) accelerate the DOD enterprise cloud environment; (2) establish a department-wide software factory ecosystem; and (3) transform processes to enable resilience and speed.</p> <p><b>Intent</b> Establish a path to deliver resilient software capability quickly. This strategy addresses aspects of the Digital Modernization Strategy.</p>

Source: GAO analysis of DOD documentation | GAO-23-105611



## Incorporating leading practices for future software modernization efforts

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### Substantial efforts made

- Employee engagement
- Stakeholder engagement

### More work remains

- Establishing goals and outcomes and measuring progress
- Implementation planning
- Software workforce

# Recommendations

## GAO-23-105611

- ...finalize an implementation plan for the Software Modernization Strategy. (status: implemented)
- ...develop high-quality performance measures for future software modernization efforts. (status: partially addressed)
- ...identify leaders' roles and responsibilities for software reforms. (status: partially addressed)
- ...identify and provide the resources needed to lead DOD's software acquisition and development reform efforts. (status: open)
- ...finalize an implementation plan for the Software Science and Technology Strategy. (status: open)
- ...collect data to measure progress on software modernization goals. (status: open)
- ...develop a workforce plan to address gaps in the skills and competencies needed to achieve software modernization goals. (status: open)

## GAO-23-105867

- ...incorporate Agile principles into requirements policy and guidance for all programs using Agile for software development. This should include a Capability Needs Statement and User Agreement. (status: open)
- ...incorporate oversight of Agile development of software into acquisition policy and guidance for all programs using Agile. This should include use of metrics, including outcome-based metrics, and continually assessing the value of capability delivered to support iterative software development. (status: open)
- ...establish an overarching plan—which identifies associated resources—to enable the adoption of modern engineering tools, across all programs. This should include (1) mission engineering, (2) systems engineering, and (3) software engineering. (status: open)