Carnegie Mellon University
Software Engineering Institute

DoD Software Acquisition Pathway

Modernizing & Speeding Software Acquisition

RECOGNIZING THE IMPERATIVE TO MODERNIZE SOFTWARE ACQUISITION POLICY, the Office of the Undersecretary of Defense for Acquisition and Sustainment (A&S) turned to the Software Engineering Institute (SEI) for expert guidance. The SEI's unique integration of data-driven insights, software engineering research, and acquisition science were critical to the October 2020 issuance of Department of Defense Instruction 5000.87 (DoDI 5000.87), the DoD's Software Acquisition Pathway (SWP). The SWP departs from decades of hardware-based acquisition regulations. It helps the DoD acquire software by applying modern software practices, including Agile and DevSecOps, to deliver software capabilities with a speed that matches dynamic mission needs, ensuring the Department of Defense remains agile and mission ready.

As software engineering techniques evolve, SEI research has focused on driving changes to help scale the software acquisition workforce, reduce the complexity of acquisition rules, and adapt acquisition practices to enable decisive action, accelerating the adoption of commercial and scientific innovations. As a result of this deep expertise and extensive practical experience in software process measurement, Agile methods, DevSecOps, acquisition, and software modernization, the DoD had already engaged the SEI in conducting the Defense Innovation Board's foundational 2019 Software Acquisition and Practices (SWAP) Study, and the design and execution of the FY18 National Defense Authorization Act (NDAA) Section 873 and 874 Agile pilot programs.

The SEI team's deeply rooted experience in technology adoption/transition and grounded and action research enabled the DoD to execute an effective, best-practice-driven approach for developing, analyzing, characterizing, and maturing observations and recommendations from the execution of the Agile pilot programs across a wide variety of system contexts. High quality empirical results from this pilot program quickly informed the direction of SWP development, in accordance with Section 800 of the FY20 NDAA.

> *"It is a top priority for DoD to reform its acquisition processes in order to acquire, deliver, and iterate on our weapon and business systems—including software—at speed and scale for our Warfighter."*
>
> — Hon. Pete Hegseth, Secretary of Defense

The SEI team worked hand-in-hand with stakeholders across the DoD and the defense industrial base in the iterative development, testing, and updating of the policy and supporting tools and resources. The SEI's unique role at the nexus of academia, industry, and government helps to bridge perspectives to prime for broad and well-supported adoption of the SWP.

Programs and policy owners continue to benefit from the SEI's data- and experience-based contributions. Since the publication of the SWP in late 2020, the SEI has worked extensively with SWP adopters to effectively implement the SWP in different program contexts, identify barriers and challenges, and monitor outcomes.

These activities create an important feedback loop that informs future policy refinement and the development of improved guidance and resources necessary to further accelerate and scale SWP adoption. One such effort is DoD's Weapons Ignite toolkit, which will contain evidence-based best practices that can be adopted to deliver safety-critical software capabilities faster and to enable more weapons programs to adopt the SWP.

About the SEI

The Software Engineering Institute (SEI) advances software as a strategic advantage for national security. We serve the nation as a federally funded research and development center (FFRDC) sponsored by the U.S. Department of Defense (DoD).

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