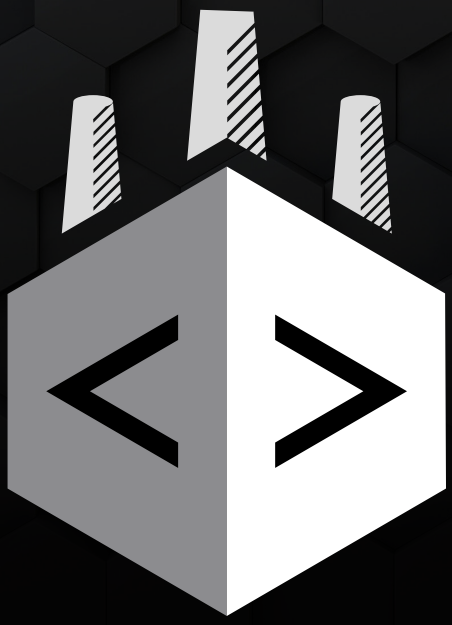


SOFTWARE FACTORY

BY SOLDIERS. FOR SOLDIERS.

ANNUAL REPORT 2021

U.S.ARMY

Introduction

"Make no mistake, data and software will be as important as ammunition on the future battlefield."

— Secretary of the Army Christine Wormuth

Army Futures Command launched the Army Software Factory as an unprecedented initiative to testbed the idea of empowering Soldiers and Department of the Army Civilians to build software solutions for Army problems in-line with modern technology companies. If the concept proves successful, its blueprint could result in lasting impacts across the Army by demonstrating a more versatile business model for developing software solutions and better positioning Soldiers to operate on a highly-technical and disconnected future battlefield.

Like every Fortune 500 company today, Army leadership recognizes that dominating in the future operating environment will be about software, talent management, and continuous workforce development. The Army cannot be singularly focused on modernizing its weapons platforms without advancing its workforce in parallel.

The ultimate objective of the Army Software Factory is to up-skill the Army's workforce while experimenting with a tech-oriented future force design. In the short term, it builds digital competencies across the Army at all echelons, offers Soldier-built solutions to Army problems, and harnesses the innovative spirit of the nation through close collaboration with the tech sector.

This inaugural Annual Report highlights some of the remarkable successes in the Army Software Factory's first full year of operation and how it delivers resilient software at the speed of relevance…

…by Soldiers, for Soldiers.

Secretary of the Army Honorable Christine Wormuth visits with ASWF Soldiers at the Army Software Factory, 20 September 2021

About the Army Software Factory

The Army Software Factory (ASWF) is an innovative operational software unit built upon industry best practices. It constantly improves processes, which will lead to a self-sustaining and government-only presence.

ASWF is co-located with Austin Community College (ACC) in downtown Austin and just a short walk from Army Futures Command (AFC) Headquarters. The experience follows a "train-the-trainer" model and consists of three stages: an upfront academic stage with tech internships, an industry pairing stage in which each participant builds software with a counterpart from industry, and a trainer stage in which participants begin to teach follow-on cohorts.

The intent is to slowly reduce the reliance on contracted support until the Soldiers and Department of the Army (DA) Civilians are running operations independently. This progressive model will allow the Army to incrementally learn, improve upon, and master key technical practices like DevSecOps, Agile software development, and cloud-native operations.

DevSecOps is an organizational software engineering culture and practice that aims at unifying software development, security and operations.

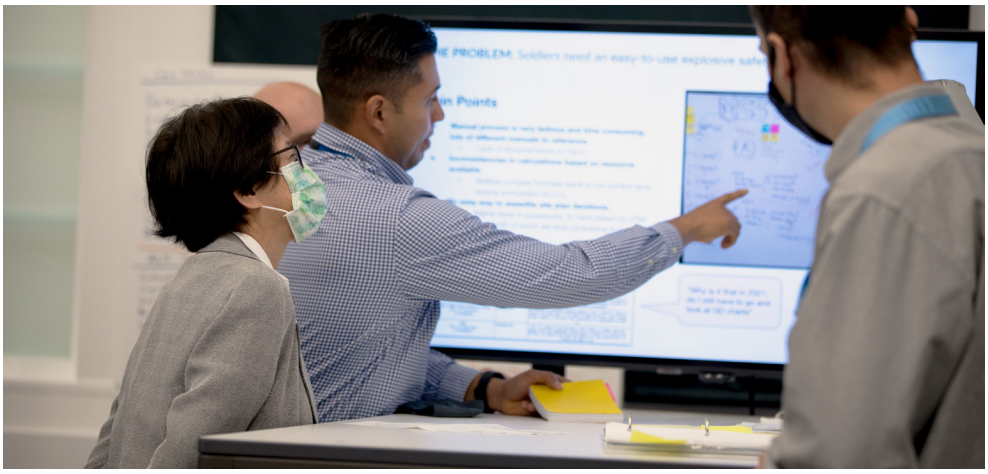
In 2021, ASWF immersed 55 Soldiers (Private First Class to Major) and DA Civilians across two cohorts in agile software development. They serve on agile software teams that focus on an aspect of modernization important to both Army Futures Command and Soldiers at all levels of the Army, such as readiness and well-being.

Chairman of the Joint Chiefs of Staff General Mark A. Milley and **Army Futures Commander General John M. Murray** lead the Army Software Factory Ribbon Cutting, 15 April 2021

2021 In Review

2021: A Year of Growth, Learning, Achievements

In 2021, the Army Software Factory developed and released several software applications and solved real Army problems. Below are key highlights from ASWF's unprecedented first full year of operation.



Undersecretary of Defense for Research and Engineering Heidi Shyu learns about the ASWF problem evaluation process, 08 November 2021

Metrics That Matter

106
Army Problem Submissions Evaluated

12
Teams Across Two Portfolios

99
Days to Production for First Application

8
Applications Produced

Production refers to making an application live for use by Soldiers across the Army.

523
Soldiers Involved in Beta Testing

1
Week Deployment Frequency

27
Military Occupational Specialties

Deployment Frequency is a key metric used to ensure software is delivered early and often.

Army Software Factory Values
Soldier-Centered
Embody Grit and Resiliency
Trust and Transparency in All We Do
Default to Empathy and Kindness
Continuous Learning

Building Digital Competencies Across the Army to Dominate an Information-centric Battlefield

- Established the Army's first **Military Occupational Specialty (MOS) and rank-agnostic** unit for organic software development. Over 200 applicants competed for 25-30 seats in each cohort.
- Graduated the first two cohorts of Soldiers and DA civilians from the **Army Software Factory Technical Accelerator**, an immersive agile software development program led by industry experts.
- Updated DA PAM 611-21 with five **new Additional Skill Identifiers (ASIs) for software development** and made initial awards following a rigorous assessment process.

Army Software Factory ASIs
5F (Product Manager)
5G (Software Product Designer)
5J (Software Development Engineer)
5L (Platform Engineer)
5M (Technical Mission Force-Cadre Course)

Solving Army Problems by Leveraging DevSecOps Practices and Cloud Technology

- Partnered with the **Army Chief Information Officer** and **Army Enterprise Cloud Management Agency (ECMA)** to deliver a secure cloud ecosystem and path to Production to Army users around the globe. This enabled over 100 clients from across DoD to get secure, resilient, and scalable applications to users.
- Implemented a data-driven, scalable **problem submission and evaluation process** and selected Army problems with the highest potential impact from over 100 submissions.

Harnessing the Innovative Spirit of the Country

- Partnered with **Austin Community College** through an innovative Intergovernmental Support Agreement (IGSA), a public-public partnership for support services.
- Conducted over 30 **professional development sessions with tech sector leaders**, including the top three companies on the Fortune 500.
- Enabled **Bring Your Own Device (BYOD) capability** for ASWF applications as the Army's first beta users for the General Services Administration's login.gov. Pioneered the internal use of versions of Google Workspace and Slack authorized to process Controlled Unclassified Information (CUI).

The ASWF Software Development Process

"[DoD shall] provide capabilities and platforms to enable continuous development and integration of software using public and private sector best practices"

— Section 836, FY21 National Defense Authorization Act

Empowering Soldiers Through Enablement

The first step of the ASWF development process is enablement, which is process of transforming Soldiers into self-sufficient software developers through immersion into agile software development principles and coaching from industry experts.

Applying Lean Software Development Principles

Inspired by lean manufacturing, it is critical to understand the problem that needs to be solved before writing a single line of code. ASWF applies lean principles as it accepts problem ideas from Soldiers.

Scoping With Soldier Touchpoints

ASWF works with Soldiers to scope problem ideas over several phases. This ensures root causes are addressed and that a custom software solution is the most appropriate course of action. The result of scoping is a succinct problem statement.

Focusing on Soldier-Centered Design

The software team uses the problem statement to begin Discovery and Framing (D&F). They work with Soldiers to define the scope of the problem space and conduct research to understand mission goals. Software teams validate a "just-enough" initial solution known as the Minimum Viable Product (MVP), usually within 1-2 months.

Senator John Cornyn (R-TX) commemorates the matriculation of Cohort 1 along with Senior Official Performing the Duties of Under Secretary of the Army Mr. Chris Lowman, 23 July 2021

Supporting the Army DevSecOps Ecosystem

"To realize the full benefit [of DoD Software Factories], these capabilities must effectively couple technology (e.g. tools and platforms) with process change (e.g. security authorization and testing"

— Department of Defense Software Modernization Strategy, November 2021

ASWF and ECMA couple technology and process change through the Army DevSecOps Ecosystem (DSO-E). Together, they operate the Army's Code Resource and Transformation Environment (CReATE), a cloud-native Army software development ecosystem with worldwide users.

ECMA

CReATE is authorized at Impact Level 4 (IL4) to support processing of Controlled Unclassified Information (CUI). IL5 authorization is expected in the future. CReATE is architected as a multi-cloud environment for resiliency and utilizes multi-cluster Kubernetes to support the flexibility necessary for development while maintaining scalability, uniformity, and security that meets or exceeds DoD standards. DSO-E is investigating tactical edge stacks to support Multi-Domain Operations (MDO) in denied, disconnected, or degraded environments.

Kubernetes (K8s) is an open-source system for automating deployment, scaling, and management of containerized applications.

Security authorization is critical for getting apps into the hands of Soldiers. An Authority to Operate (ATO) can take 18 months and looks only at a snapshot in time. DSO-E has delivered an ATO in under **four months** with a target of **less than 90 days** utilizing a continuous Risk Management Framework (cRMF) model, the first of its kind in the Army.

The DSO-E partnership on CReATE enables Soldiers to get secure, resilient, and scalable applications in the hands of their users **14 months faster** than the status quo. It also advances a key goal from the Army Data Plan by maintaining services in a resilient and secure hybrid cloud. Together, they are modernizing the largest U.S. Government organization and meeting key tenets of the DoD Software Modernization Strategy.

Authority to Operate

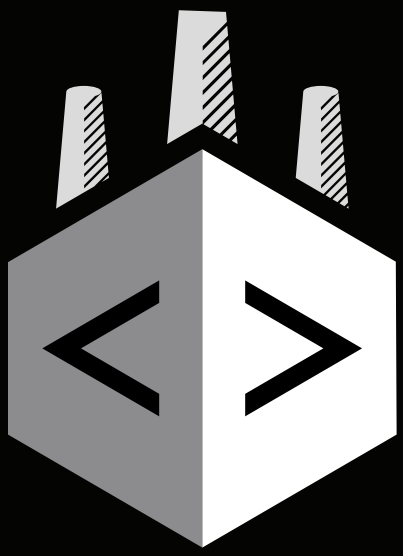
18 Months → **4** Months

Additional reductions expected in 2022

"The ability to secure and rapidly deliver resilient software is a competitive advantage that will define future conflicts."

— Deputy Secretary of Defense Kathleen Hicks

Deputy Secretary of Defense Kathleen Hicks observes the PMCS application on the Army Software Factory development floor, 21 May 2021



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