State of Lean and Agile at DHS Today
September 17, 2020

Presented to:
FY20 Joint Information Technology and Software Cost Forum

Presented by:
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How much experience do you have with Agile Software Development?

A) I’ve heard of it.

B) I’m learning as I go.

C) I know enough to be dangerous.

D) I don’t want to brag, but…
Our Agile Journey

2014
- Drafted initial Agile Policy (Agile Instruction Manual MD-102-01-004-01)

February 2016
- Conducted AAWG Pilots; collected lessons learned and best practices

June 2017
- Began driving implementation of the 18 Action Plans

September 2017
- Declared 10 of the 18 Action Plans closed based on near term definition of done

September 2018

April 2019
- Continuing to implement FY20 improvements and complete longer term items

Today
- All original 18 Action Plans met their near term definition of done and are considered closed
# Initial & Anticipated Results Summary

## Reduced Risk

The **Streamlined Software Acquisition Process** established Solution Architecture earlier to inform KPPs and more clearly defined requirements.

Revised **TEMP** Guidance requires incremental testing vs. after development is complete.

Revised **JRIMS MD-107-01** Instruction includes Cybersecurity and Privacy.

**Lean AoA** template and guidance created which incorporated the 22 GAO #17-799 Best Practices.

## Reduced Cycle Time

Prior to Pilot implementation programs required **24 months**, on average, to reach ADE2A/2B.

- **FEMA GMM** Reached ADE2A/2B in **16 months**
- **ICE SEVIS** Reached ADE2A/2B in **7 months**
- **TSA TIM** Rightsized to ADE2A/2B rebaseline in **16 months**
- **USCIS VER MOD** Achieved ADE-2B prior to pilot

## Improved Business & Mission Value

Cross walked the Acquisition Lifecycle Framework Templates and identified **66 repetitive requests for information**.

Established function point analysis methodology

**Cost estimate BPA** now in place

Enterprise Architecture touchpoints incorporated in **MD-102-01-001**

## Improved Cost Estimation

Introduced the **Digital Review & Adjudication Workflow (DRAW)** tool to increase accountability of HQ reviewers and provide transparent status of artifacts to Programs. Programs submit the following artifacts via DRAW:

- CDP, APB, ILSP, LCCE, SELC-TP, AoA/AA Study Plan

## Increased Transparency
Survey Question

How many policies do you think needed to be updated to support the change to Agile?

A) 0-4
B) 5-9
C) 10-19
D) 20+
Streamlined Software Acquisition Process

Requires that programs have a **stronger understanding of the current state** as well as a notional idea of their ideal operating concept.

Ensures programs have the technical support to make informed decisions.

**Encourages engagement** with the small business market and exploration of new and emerging tech companies not traditionally doing business with the federal government.

**Allows programs to begin building immediately** after Obtain by requiring that the necessary details be in place much earlier in the process.

**Reduces risk** by encouraging programs to begin prototyping much earlier in the process.
**Tools to Leverage**

**Maestro**
A DHS web application that offers visualization capability and enhanced data quality for business and technology information from across the DHS Enterprise.

**Mobius**
A DHS-approved platform that provides a centralized suite of productive tools (JIRA, Confluence, Bamboo, etc.) that allow IT and business teams to seamlessly collect, track, and measure work within and across projects.

**DRAW**
The Digital Review and Adjudication Workflow (DRAW) system is an electronic, organizational document management processing tool through which acquisition documents may be submitted, tracked, and processed for formal comment reviews, approvals, and sign-offs.

**Connect**
The intranet for DHS divisions and components, with employee resources, recent news, links to policies and guidance, templates and much more.
Measuring Progress

- **OMB requires all Agency IT projects** to provide information on planned incremental delivery of functionality and include the dates of their last three releases.

- DHS uses Investment, Evaluation, Submission, and Tracking System (INVEST) to track.

- DHS CTO requires all Software Development programs to report their **Agile Core Metrics** every month via INVEST.

**FITARA Score Card**
This biannual assessment is used to compare all federal agencies across a matrix of criteria, to include “Agency CIO Authority Enhancements (Incremental Development)”.

**DHS CIO Agile Certification**
This monthly assessment is used to track agile adoption and implementation within DHS Software Development projects.
Information Technology Program Management Center of Excellence
(ITPM COE) – Email: DHSOCTO@hq.dhs.gov

Consisting of DHS Headquarters (HQ) Directorate and Management representatives, the ITPM COE acts as a cross-functional team to identify and promote best practices, provide tools and information, and coordinate assistance to programs and projects to maximize the successful management of DHS IT investments.

Agile Center of Excellence
(Agile COE) – Email: AgileCOE@hq.dhs.gov

The Agile COE provides guidance, governance, and resources to DHS IT development programs and projects, as well as IT professionals in efforts to increase their understanding and successful execution of Agile IT software development.
The **S&T Directorate, Office of Systems Engineering** briefs Components on updates to the Systems Engineering Lifecycle (SELC).

The **Agile Acquisition Working Group** will conduct roadshows to all Components throughout 2020 and 2021.

This **day-long expo** features speakers, workshops, information tables and more; with representatives from across DHS.

The **Agile Acquisition Working Group** are available upon request to give individual briefings on the state of Agile at DHS.

The **Acquisition Review Board** decks were revised and then instituted via USM memo – these decks provide consistent communication for all IT acquisition programs.

**Program Accountability & Risk Management (PARM)** conducts periodic presentations to Components, explaining policy changes.

**Strategic Technology Management** within the DHS Chief Technology Officer Directorate are available upon request to give individual briefings on the state of Agile at DHS.
What’s Next in Agile?

Make available as many of these Agile techniques as practicable to non-major IT Programs

Offer new funding alternatives empowering Components to flexibly spend based on mission needs

Create a master dashboard of Agile adoption across the enterprise

Make **SecDevOps** the standard way of developing software at DHS
So, we know about Agile, but how much do you know about SecDevOps?

A) I’ve heard of it.

B) I’m learning as I go.

C) I know enough to be dangerous.

D) I don’t want to brag, but…
**SecDevOps Campaign**

**Purpose:** To further transform Agile software development by making SecDevOps a standard practice to reduce cost and timelines for increased security and stability across DHS.

**Definition:** An IT delivery methodology that aims to alter culture and practice to create a delivery workflow that meets the needs of security, development, and operations stakeholders with minimal overhead. SecDevOps includes security-focused automation, a reliable release pipeline, automation of common tasks, and solutions to enable stronger collaboration across all stakeholders (security, development, and operations) with the goal of deploying working functionality to the end-user faster.

*For the purpose of this presentation we have tailored Gartner’s “Infinity Loop” DevOps model to illustrate our overall IT Maturity at DHS.*
Benefits of SecDevOps

- Reduced mean-time to production: the average time it takes from when new software features are required until they are running in production.
- Increased deployment frequency: how often a new release can be deployed into the production environment.
- Fully automated risk characterization, monitoring, and mitigation across the application lifecycle.
- Software updates and patching at “the speed of operations”.
Break Down Silos
Drive a culture of innovation that values transparency, accountability, and increases collaboration.

Leverage Technology to Automate
Testing, security, infrastructure, and compliance as code.

Develop Simplified & Secure Processes
Normalize processes and follow an approved path for development.

Create a Scalable Framework
Establish policies that support automation and compliance.
Meet with Partners on a regular basis to share ideas, discuss challenges, address roadblocks, and celebrate successes.

Collaborate with stakeholders to finalize Action Plans and begin decomposing them into manageable tasks.

Complete necessary revisions to the SecDevOps Guidebook, Pilot Maturity Identification Questionnaire, and SecDevOps Core Metrics.

Identify and partner with Pilot Programs to further support SecDevOps implementation.
Questions?

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In February 2016 USM Deyo initiated the Acquisition Agile Pilot Program to address:
- Programs delivering late or over budget
- Low levels of transparency
- Poor requirements development and traceability
- Long timeframes to deliver

The Agile Acquisition Working Group (AAWG) was stood up to collaborate on the improvements to policy, governance, and acquisition guidance to facilitate agility, flexibility, and innovation.

DHS chose five software programs at various stages of the acquisition life cycle for their high visibility and mission impact.
The Five Agile Pilots

- **TSA TIM**
  TSA Technology Infrastructure Modernization

- **ICE SEVIS**
  ICE Student & Exchange Visitor Information System Modernization

- **FEMA NFIP Pivot**
  FEMA National Flood Insurance Program - Pivot

- **USCIS VER MOD**
  USCIS Verification Modernization

- **FEMA GMM**
  FEMA Grants Management Modernization
ALF and SELC Crosswalk

- Utilized a Lean Six Sigma tool to map and cross-walk each paragraph and requirement of existing ALF/SELC templates
- Flagged redundancies and areas for streamlining the process
- Identified 66 repetitive touch points

Ribbons connect various sections of templates and represent where templates are requesting the same or similar information. Different color ribbon represent the various originating documents. Artifacts are organized by ALF phases.
<table>
<thead>
<tr>
<th>AAWG Action Plan</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td><strong>1</strong> Automated Workflow Tool for Artifact Review</td>
<td>Improve the process for acquisition document review, adjudication, and approval, enabled by workflow management and process automation technology solutions</td>
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<td><strong>2</strong> Unified Authority for Action Plan Implementation</td>
<td>Establish a Unified Authority to govern, institutionalize, and manage the implementation of AAWG Action Plans and enable continuous improvement of IT acquisitions and delivery</td>
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<td><strong>3</strong> Embedded Support for Agile Acquisition (NextGen AAWG)</td>
<td>Establish a scalable future operating model for support of Level 1 and 2 acquisition and IT programs</td>
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<td><strong>4</strong> Defined Roles &amp; Responsibilities</td>
<td>Define roles and responsibilities for each step or phase of the ALF and SELC</td>
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<td><strong>5</strong> Agile Governance through Obtain</td>
<td>Incorporate Agile governance and review models to increase transparency and feedback throughout the Obtain Phase and Operations and Maintenance (O&amp;M)</td>
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<td><strong>6</strong> Realigned 2A/2B Decision Points</td>
<td>Modify principle acquisition decision points and production reviews, including ADE-2A and ADE-2B, Initial Operating Capability (IOC), Full Operating Capability (FOC), and Production Readiness Reviews (PRR) Closing Mar 2019</td>
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<td><strong>7</strong> Requirements Identification</td>
<td>Review DHS acquisition guidance, policy, and practices for the identification and management of requirements through the JRC</td>
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<td><strong>8</strong> Testing &amp; Integration Guidance</td>
<td>Update DHS acquisition guidance, policy, and practices for testing and evaluation to enable modern best practices in automated testing and continuous integration</td>
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<tr>
<td><strong>9</strong> Tech Solutions &amp; AoA</td>
<td>Update the DHS acquisition guidance, policy and practices for evaluation of technical solutions and vendors, including a lean AoA</td>
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<td>Update the DHS acquisition guidance, policy and practices for initial cost estimation and LCCE reviews for multiyear IT programs</td>
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<td>Map current, future, and ideal state process relationships across the entire ALF/SELC to identify continuous improvement opportunities</td>
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Note: ✔️ = Complete
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<tr>
<td><strong>Agile ALF Templates</strong></td>
<td>Remove redundant requirements for program documentation and provide clarifying expectations for Agile tailored ALF artifacts</td>
</tr>
<tr>
<td><strong>Agile Core Metrics</strong></td>
<td>Establish performance-based delivery metrics and measures to monitor program delivery health</td>
</tr>
<tr>
<td><strong>Enterprise Architecture Touchpoints</strong></td>
<td>Enforce IT EA touchpoints within MD-103-02, ALF and SELC ensuring EA practices are embedded</td>
</tr>
<tr>
<td><strong>Operational Testing Authority Vendors</strong></td>
<td>Develop strategic sourcing strategy for Operational Test Authority vendors</td>
</tr>
<tr>
<td><strong>Assessment Using Maturity Models</strong></td>
<td>Codify, implement, and apply the Software Delivery Maturity Model and Agile Maturity Model in Program Health Assessments for DHS Component organizations and programs</td>
</tr>
<tr>
<td><strong>Data Analytics</strong></td>
<td>Pursue text and business analytics tools leveraging automation capabilities to increase effectiveness of program analysis</td>
</tr>
</tbody>
</table>

Closing: March 15

Closing: April 13

Closing: April 16

Closing: April 17

Closing: April 18
## Agile Core Metrics 2.0

<table>
<thead>
<tr>
<th>Metric</th>
<th>Category</th>
<th>Metric Description</th>
<th>Value Description</th>
<th>FY 20 Q1</th>
<th>FY 20 Q2</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>Performance / Quality</td>
<td>% of downtime for the month</td>
<td>Indicates stability of the application / platform and highlights disruptions (if any) in service to users.</td>
<td>60</td>
<td>70</td>
<td>↑</td>
</tr>
<tr>
<td>Change Failure Rate</td>
<td>Performance / Quality</td>
<td>% of deployments that needed to be rolled back for the month (# rolled back releases / total # releases)</td>
<td>Change failure percentage is important because organizations with a low change failure percentage introduce less risk and spend less time repeating work that has already been completed.</td>
<td>15</td>
<td>0</td>
<td>↑</td>
</tr>
<tr>
<td>Deployment Rate</td>
<td>Performance / Quality / Schedule</td>
<td>Number of Deployments to Production for the month</td>
<td>Programs deliver more valuable work when responding to user feedback. Smaller, more frequent deployments speed the delivery of usable functionality to the user and the rate of user feedback to the product development team.</td>
<td>58</td>
<td>64</td>
<td>↑</td>
</tr>
<tr>
<td>Cycle Time</td>
<td>Schedule / Performance</td>
<td>Avg # of business days between start of work and deployment to production for each story deployed in the reporting period</td>
<td>Indicates how quickly users see value from their desired features. As teams norm and improve, they become more efficient and productive. The amount of time between when they start work and when that work is completed typically shortens.</td>
<td>71</td>
<td>71</td>
<td>↔</td>
</tr>
<tr>
<td>Unit Test Coverage</td>
<td>Performance / Quality / Security</td>
<td>% of code covered by unit testing</td>
<td>High unit test coverage mitigates risk of deploying defects. In order to be rolled up effectively, report both the coverable lines of code in the current codebase and the lines of code covered by automated tests.</td>
<td>87</td>
<td>89</td>
<td>↔</td>
</tr>
<tr>
<td>Cost Per Story</td>
<td>Cost / Schedule</td>
<td>Cost per sprint / number of story points or stories or function points</td>
<td>Average cost per unit of delivered value should decrease over time. Costs per sprint are determined by [(rate per person*team size)<em>8 hours</em>days] for a blended rate team. If known, actual rates and hours can be used. Calculate story points, function points, or stories (completed stories) after each sprint, but measure the same thing each sprint.</td>
<td>38 K</td>
<td>23 K</td>
<td>↑</td>
</tr>
</tbody>
</table>
This is a snap-shot list of trainings available via FAITAS that have been updated, are currently being updated, or will be updated to reflect Agile implementation.

<table>
<thead>
<tr>
<th>Course Title</th>
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<tbody>
<tr>
<td>Introduction to Agile Software Acquisition</td>
<td>CLE 076</td>
</tr>
<tr>
<td>Agile Acquisitions 101: Means behind magic</td>
<td>FCL-A-0024</td>
</tr>
<tr>
<td>Intermediate Agile Techniques for Contracting</td>
<td>FCN 605</td>
</tr>
<tr>
<td>Agile Acquisition – 2 Day</td>
<td>FPM 423</td>
</tr>
<tr>
<td>Acquisitions of Agile Services</td>
<td>FQN 471</td>
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<tr>
<td>DHS Program Management Fundamentals</td>
<td>APM 102</td>
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<tr>
<td>DHS Introduction to Acquisition</td>
<td>AQN 101</td>
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<tr>
<td>DHS Fundamentals of Cost Analysis</td>
<td>BCE 106</td>
</tr>
<tr>
<td>DHS JRIMS Overview</td>
<td>FAC 061</td>
</tr>
<tr>
<td>DHS Cybersecurity Test and Evaluation Course</td>
<td>FAC 062</td>
</tr>
<tr>
<td>Introduction to EAGLE Next Generation</td>
<td>FCL-DHS-0110</td>
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<tr>
<td>Core Concepts of DHS JRIMS</td>
<td>FQN 644</td>
</tr>
<tr>
<td>DHS Test and Evaluation for Information Technology</td>
<td>FTE 201</td>
</tr>
<tr>
<td>DHS Systems Engineering Lifecycle</td>
<td>SE 100</td>
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Login to FAITAS <https://faitas.army.mil/faitas>
SecDevOps Action Plan
Recommendations

People

People Rec #1 Change the Culture
Establish strong people, culture, and principles that embody SecDevOps practices.

People Rec #2 Strengthen Cyber & Technical Workforce
Enhance and maintain the existing cybersecurity and technical workforce talent across the Department.

People Rec #3 Dedicate Technical Support to Programs
Dedicate Component OCIO staff to be embedded in SecDevOps program teams.

People Rec #4 Roadshow Improvements
Showcase and communicate the SecDevOps Campaign results through a post implementation roadshow with programs.

Process

Process Rec #1 Streamlined Continuous ATO
Streamline and implement a continuous ATO process Department-wide.

Process Rec #2 Supportive Contracting
Implement contracting practices supportive to SecDevOps that all Components can leverage.

Process Rec #3 SecDevOps Playbook
Create an online SecDevOps Playbook that guides programs on how to implement SecDevOps regardless of maturity.

Process Rec #4 Technology Reference Model Optimization
Support the acquisition and use of SecDevOps tools by providing up-to-date information on pre-approved tool stacks.

Technology

Tech Rec #1 Determine Preferred Tools
Analyze existing tools and recommend future tools with preferred capabilities for SecDevOps.

Tech Rec #2 Automation
Automation at all levels of the pipeline removes manual intervention and error-prone tasks, allowing the team to focus on delivering a continuous quality product into production.

Tech Rec #3 SecDevOps as a Service
Ensure SecDevOps Tool Suite is available to all programs.

Governance

Gov Rec #1 Policy Instruction and Guidance
Update Policy Instruction and Guidebook to enforce and instruct how to implement SecDevOps.

Gov Rec #2 Oversight and Measurement
Establish SecDevOps program oversight to monitor maturity and collect metrics.

Gov Rec #3 SecDevOps Pilots
Identify SecDevOps pilot programs and implement Action Plan recommendations. Validate best practices and finalize Action Plan recommendations to apply Department-wide.

Gov Rec #4 Real-time Program Review
Agile governance to support real-time program updates during Under Secretary of Management (USM) Acquisition Review Boards (ARB).