

INTRODUCING AGILE/DEVSECOPS INTO THE SPACE ACQUISITION ENVIRONMENT



SYSTEMS
ENGINEERING
RESEARCH CENTER

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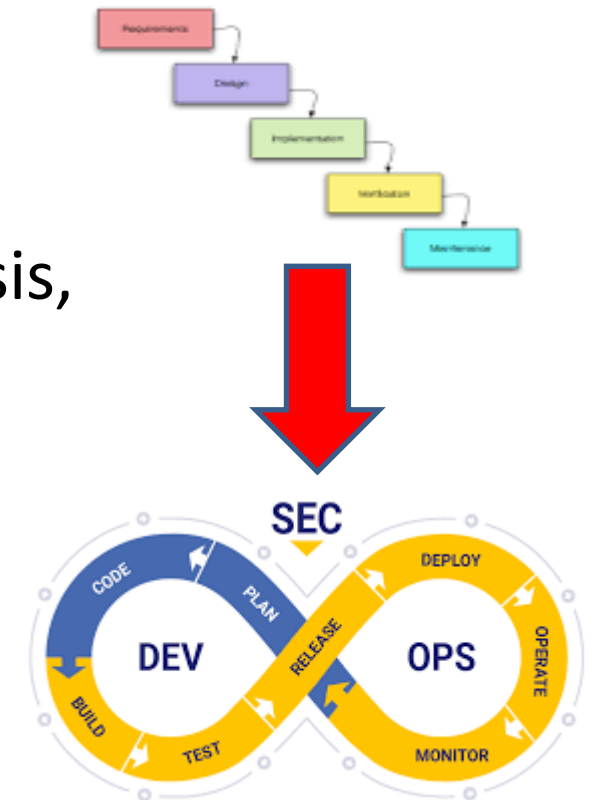
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Research Objectives



- **Improve DoD competitiveness:** Specifically - improve existing DoD space-based *software* system acquisition processes
- **Goals:**
 - Determine the mission engineering methods, analysis, and metrics to transition from traditional DoDI 5000.02 waterfall development environments to agile/DevSecOps processes
 - Includes integration of emerging technologies and related education for the future workforce



Process

1. Understand the current acquisition environment
 - Immerse into environment (become part of the team)
2. Develop approaches to transition acquisition elements from DoDI 5000.02 to Agile/DevSecOps ...including workforce training
3. Incorporate processes and “lessons-learned” into a transition process to apply to other domains

Three DoD Acquisition Projects

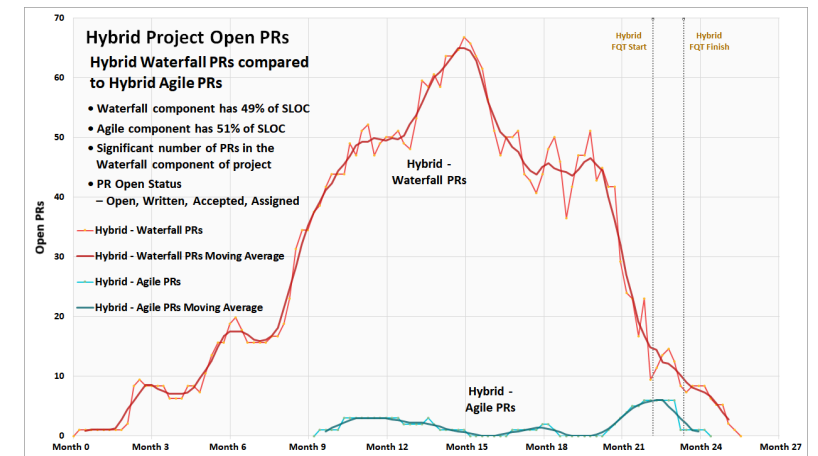
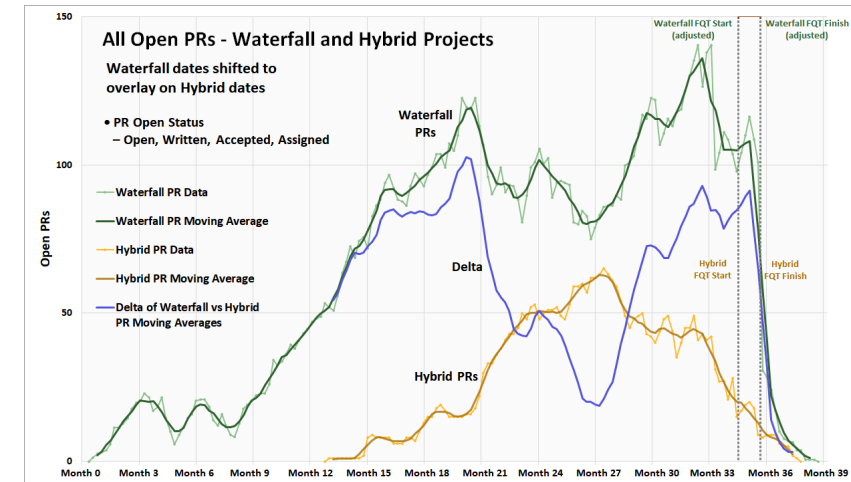
- **Project A**: Traditional waterfall method used (**completed**)
 - Duration: 39 months (includes schedule extension)
 - Software lines of code (SLOC): 178K
- **Project B**: Hybrid composed of both waterfall and agile components (**completed**)
 - Duration: 25 months
 - Software lines of code (SLOC): 113K
- **Study**:: Undertake technical explorations and stand up agile/DevSecOps environment in preparation for Project C (**completed**)
 - Duration: 15 months
 - Software lines of code (SLOC): None
- **Project C**: Agile/DevSecOps (**one year into project**)
 - Duration: Approximately 52 months
 - Software lines of code (SLOC): TBD

Baseline



Projects A and B Results

- Project A (Waterfall) vs. Project B(Hybrid): Project B produced **85.4%** less open problem reports (PRs) than Project A
- Project B (Waterfall) vs. Project B(Agile): The agile portion of the effort produced **95.7%** less open problem reports (PRs) than the waterfall portion



Study (15 months) & Project C (12 months since ATP)

Observations

- Rigidity of the Capabilities Development Document (CDD) hampers agile development operations
- Implementing agile still requires good upfront engineering
- Due to licensing issues, import controls and lack of adaptability, performance tracking tools may have to be modified or developed.
- There is no “one size fits all” agile/DevSecOps framework.
- Program increment (PI) lengths are often too short

Observations (Cont.)

- Allocate stories to sprints up front when PI planning
- Too many story points allocated to a PI and/or sprint
- Stay focused on MVP/MMPs and the project roadmap
- Training, training and training
- Need for an operations-like test environment as soon as possible

Next Steps

- Project C has started...about 12 months in
- Work with government team to continue to address observations and apply lessons learned from the study (pre-Project C)
 - For example: explore methods for improving synchronization between PI planning and the Integrated Master Schedule (IMS) which drives EVM metrics
- Continue collection of performance metrics with an eye towards velocity and related metrics.
- Continue developing/refining training materials and processes