

Agile Across Large DoD Hardware/Software Programs

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Agenda

- Program Office Perspective
 - Agile Transformation of Large Legacy Weapon System Programs
 - Aircraft Platforms with Common Hardware & Software
- Transforming Software Acquisition Policy & Practice (TSAPP)
 - Technical Agenda
 - Relevant Efforts

Agile Across Large HW/SW Programs

Program Office Perspective:

Agile Transformation of Large Legacy Weapon System Programs

Agile Transformation of Legacy Systems

Program Office Challenges



[Source: DVIDS <https://www.dvidshub.net/about/copyright>]

- Existing waterfall processes often take 3-10 years to deliver a capability
- Program offices often operate on oversight instead of collaboration
- Stakeholder involvement is less frequent
- Personnel have little experience or training in modern software and/or digital transformation methods
- Organizations are not resourced or organized for Agile

Agile Transformation of Legacy Systems

Program Office Best Practices



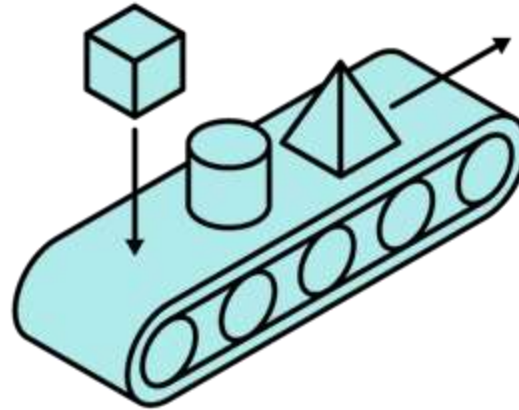
[Source: DVIDS <https://www.dvidshub.net/about/copyright>]

- Identify minimum viable processes
 - Shift from oversight to insight
 - User engagement and feedback
 - Decompose/prioritize requirements into deployable partial capabilities
 - Continuous modernization
- Resourcing, organization, training
 - Partner to resource the team
 - Team alignment vs organizational assignment; culture initiatives
 - Training with hands-on experience
 - Embed personnel where needed

Agile Represents a Major Requirements Transition – Different Acquisition Objectives

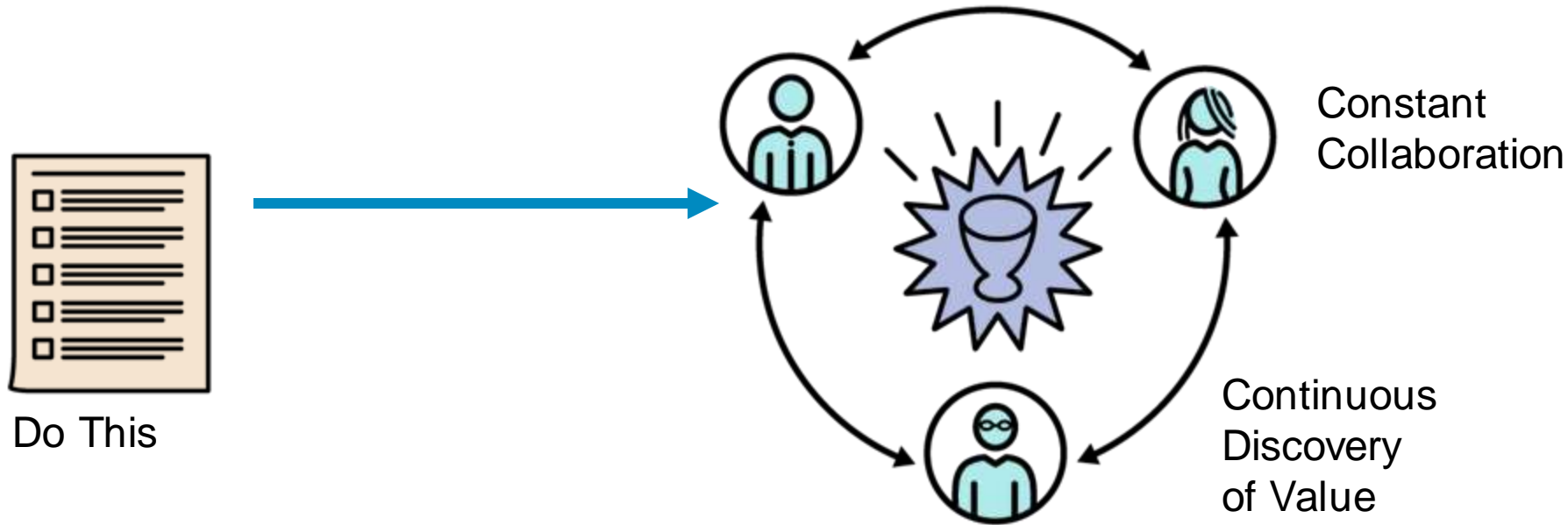


Buying a
Box

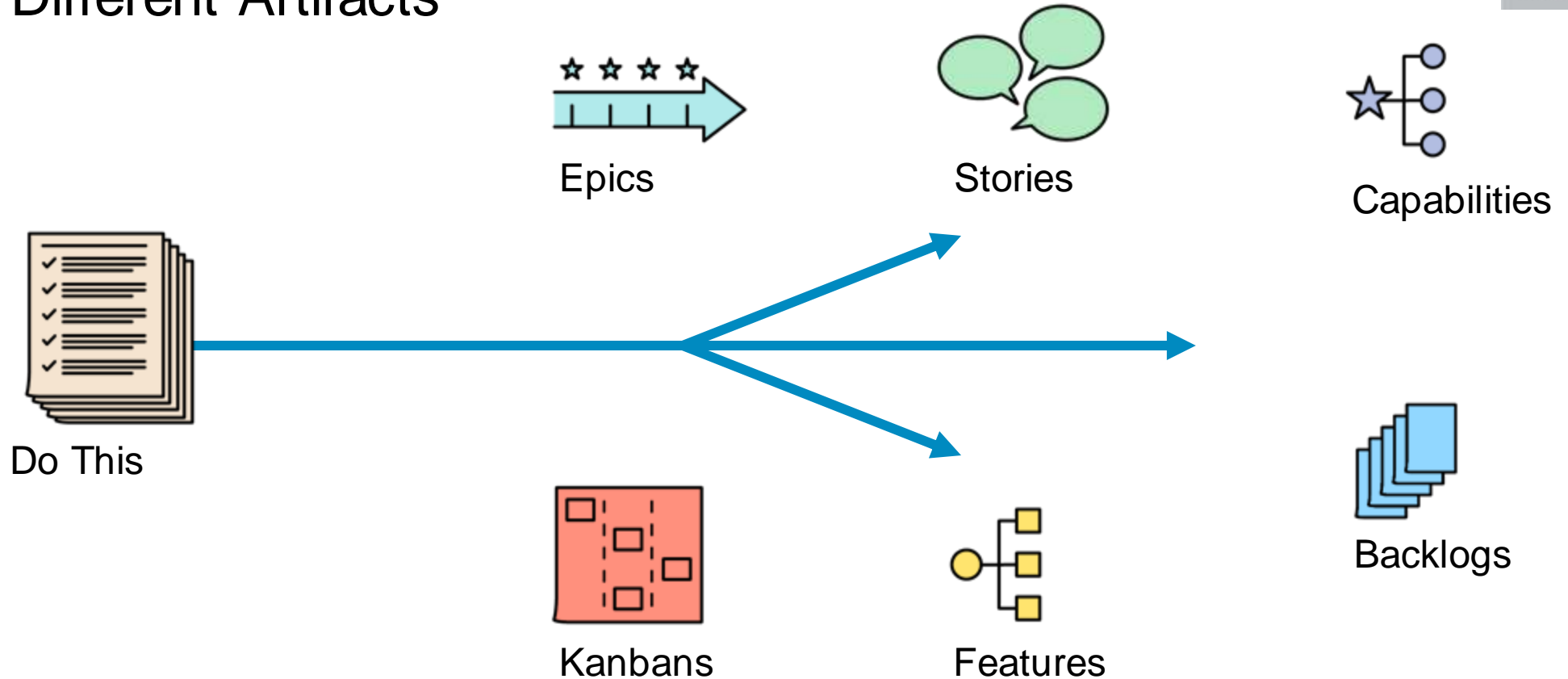


Buying an ongoing
delivery stream

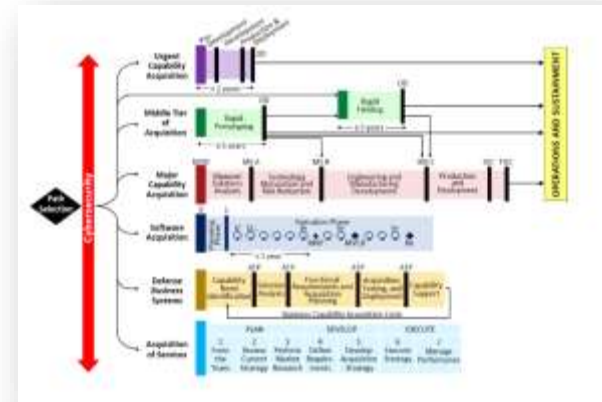
Agile Represents a Major Requirements Transition – Different Acquisition Objectives



Agile Represents a Major Requirements Transition – Different Artifacts



Agile Represents a Major Requirements Transition – Different Practices for Requirements Management

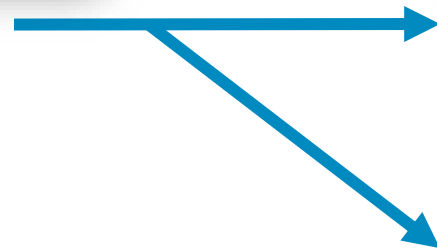


New ways of acquiring systems.

Note the Software Acquisition Pathway (SWP) for software-dominant products.

<https://aaf.dau.edu/>

Date-based Milestones



Increment-Based Demos

Definition of Done



Team Increment



System Increment

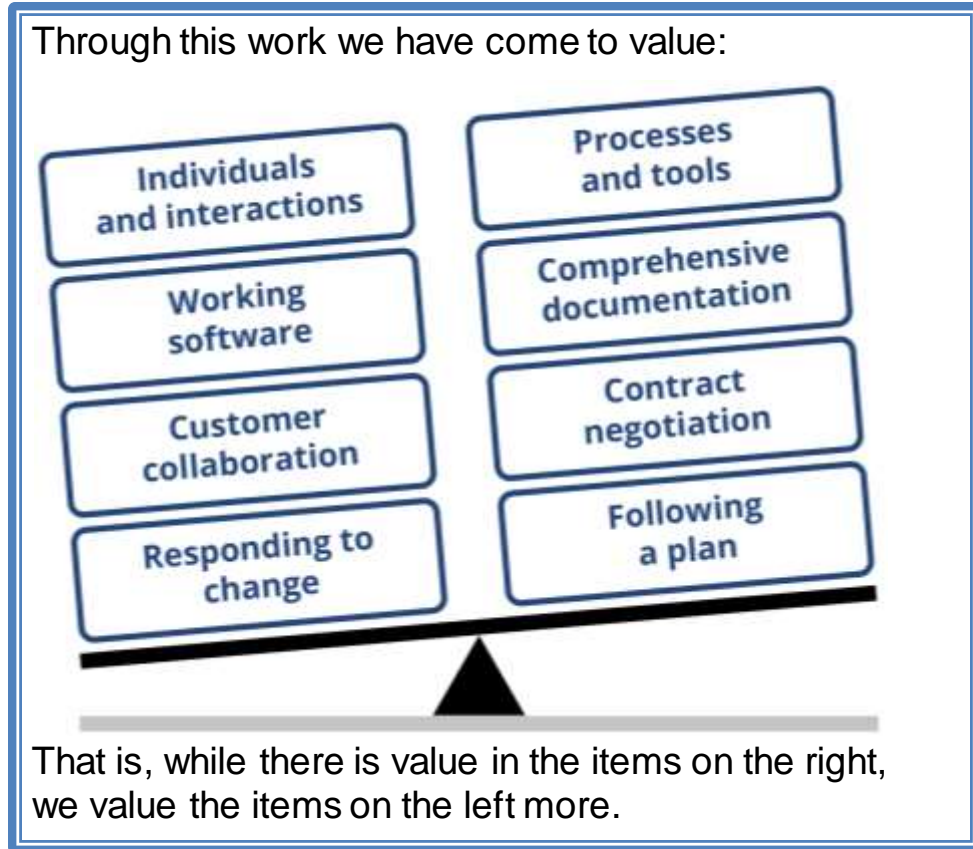


Solution Increment



Release

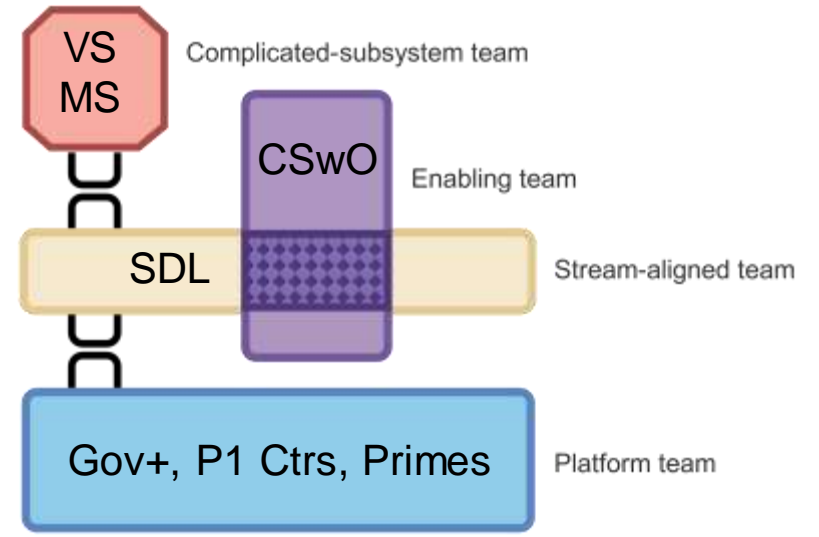
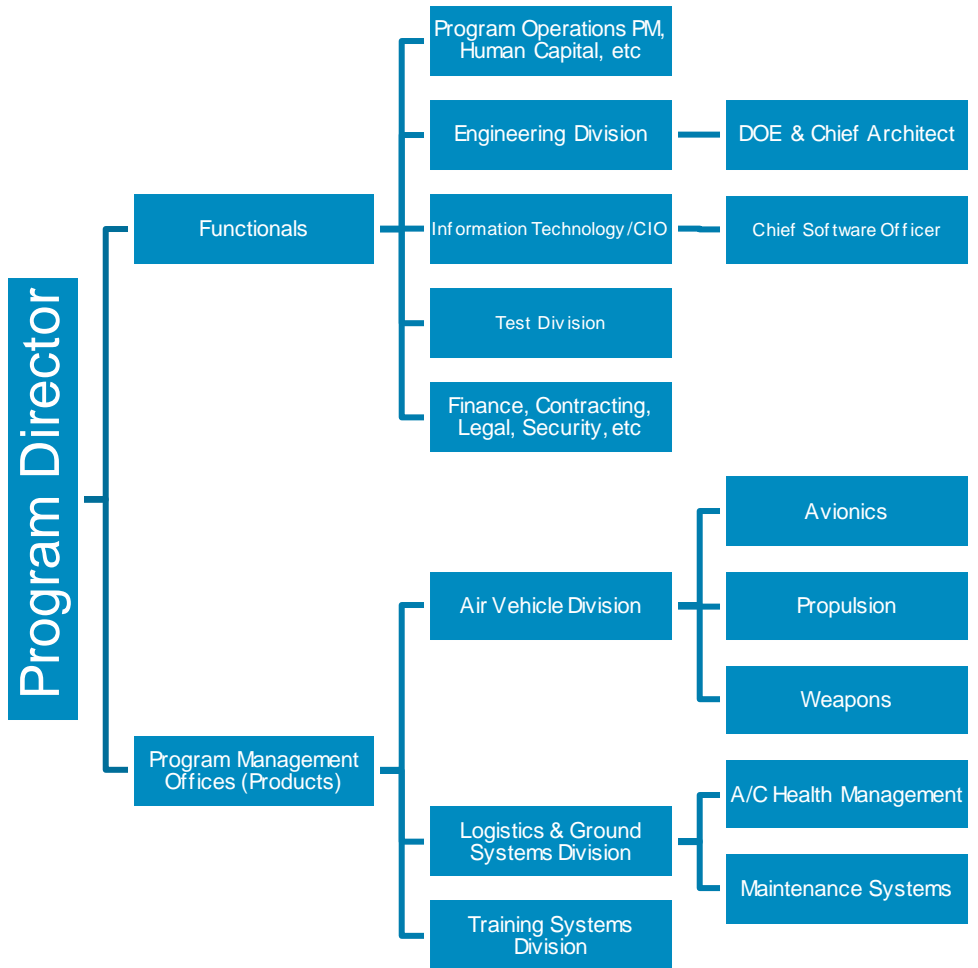
Reorienting the Manifesto for Agile Software Development Toward Multi-Program System Integration



<https://agilemanifesto.org/history.html>

Agile	Traditional
Many small batch interactions	Few large batch interactions
Demos/user feedback that explicitly exercise interfaces early and often	Primarily documentation review until late life cycle
Continuous refinement of interface-prioritized backlog across programs	Requirements & interface documents coordinated at infrequent designated acquisition points
Decisions/reqmts constantly validated with data from implementation	Decisions/reqmts periodically validated with analysis until data from implementation available (late)

Organizational Alignment vs Team Assignment



© Matthew Skelton and Manuel Pais from *Team Topologies*

Agile Across Large HW/SW Programs

Program Office Perspective: Aircraft Platforms with Common Hardware & Software

Aircraft Platforms with Common Software

Program Office Challenges



[Source: DVIDS <https://www.dvidshub.net/about/copyright>]

- Multiple models or variants
 - Different aerodynamics
 - Different versions of avionics
- Multiple users
 - International partners
 - Foreign military sales
 - Several US military services
 - Unique missions
- Multiple vendors
 - Interface & integration challenges

Aircraft Platforms with Common Software

Program Office Best Practices



[Source: DVIDS <https://www.dvidshub.net/about/copyright>]

- Contract requirements:
 - Modern hardware & software approaches
 - Digital engineering
- Stakeholder engagement:
 - Transparent governance
 - Robust processes (requirements, funding, prioritization, etc.)
- Multiple vendors:
 - Lead systems integrator
 - Modular open systems approach
 - Automated integration & test; hardware in the loop labs; modeling

Agile Across Large HW/SW Programs

Transforming Software Acquisition Policy & Practice (TSAPP)

TSAPP Technical Agenda

- **Acquisition Policy:** Develop strategies and methods to enable evolving software acquisition, modernization, sustainment (A/M/S) policy
- **Acquisition Practice:** Speed the insertion & adoption of new technology & methods into A/M/S programs
- **Data and Analytics:** Enable programs and agencies to capitalize on business/sensor/intel/performance data

TSAPP Related Efforts

- Software Pathway:
 - Program enablement
 - Embedded systems guidance
 - Organizational reference framework
 - Technical debt study
- Operational & Developmental Test:
 - DoD policy & guidance – software and cyber
 - Risk acceptance level of test (RALOT)
- Software Engineering Measurement & Analysis:
 - Improved software estimation
- Workforce:
 - Digital talent management forum & DoD cyber workforce framework
 - Training and credentialing

Contact



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Questions?

