Enhancing Adoption of Agile Software Development in DoD [To Improve Acquisition Outcomes]

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“Change is the law of life. And, those who look only to the past or present are certain to miss the future.”

President John F. Kennedy

How will we define the future?
Agile is not highly visible or a major thrust area – limited metrics (like EVM) to show ROI

- Agile is highly visible in identifying inefficient staff utilization.
- Rationale to why major “traditional” DoD suppliers have adopted Agile without Government participating may be driven by competitive forces.
- Feedback from industry teams that are composed of distributed teams across multiple companies indicate they receive daily build status vs. typical monthly (1 financial system a competitive edge).
- Government reviews on Agile programs describe unprecedented metrics & communication across Government- Industry stating “would not go back.”
Adopting Agile in DoD
When is it Right, Why is it Hard

Key Factors (& Possible Barriers) Driving Reform

- **Law** - Critical input that drives priorities and change across eco-system (e.g. WSARA)
- **Policy** - Creates new processes and institutionalizes new approaches (e.g. IT process)
- **Values/Priorities** - Implements best practices to strengthen beliefs (e.g., BBP 3.0)
- **Data** - Provides critical feedback to the key factors (e.g., DoD vs Commercial cycle-time)
Develop a strategy for the rapid acquisition of tools, apps, and other capabilities for cyber warfare for USCYBERCOM and other cyber operations components of military

- Orderly process for determining, approving operational requirements
- Well-defined, repeatable, transparent, and disciplined process for developing capabilities IAW IT Acquisition process
- Allocation of facilities and other resources to thoroughly test capabilities in development, before deployment and use to validate performance and take into account collateral damage

Additional Elements of § 933

- Prevent abuse of quick reaction processes
- Establish reporting and oversight processes
- Maintain cyber T&E facilities, resources
- Orgs responsible for O&M of cyber infrastructure
- Involve independent T&E community
- Role of the private sector
- Roles of each Service/Agency
- Promote info sharing, cooperation, collaboration
- Interoperability, innovation, avoid duplication
Overlapping Cyber & Agile Imperatives

- **DoD Cybersecurity Guide for Acquisition Program Managers, July 1, 2015**
  - Integrates cybersecurity considerations across the acquisition lifecycle
  - Includes treatment of RMF/security controls across requirements, system engineering, test/evaluation and sustainment
  - Defines what cybersecurity artifacts are needed in different phases of the acquisition lifecycle
  - Defines the roles/responsibility of the cybersecurity officials across the acquisition lifecycle

IMPLEMENTATION OF NEW ACQUISITION PROCESS FOR INFORMATION TECHNOLOGY SYSTEMS

• NEW ACQUISITION PROCESS REQUIRED — The Secretary of Defense shall develop and implement a new acquisition process for information technology systems

  • “… Be based on the recommendations in Chapter 6 of the March 2009 report of the DSB Task Force on DoD and Procedures for the Acquisition of Information Technology

  • Ne designed to include—

    (A) early and continual involvement of the user;
    (B) multiple, rapidly executed increments or releases of capability;
    (C) early, successive prototyping to support an evolutionary approach;
    (D) a modular, open-systems approach
Acquisition Model
Chapter 6 of March 2009 DSB Report

Acquisition Model: Continuous Technology/Requirements Development & Maturation

- **Impact to Core DoD Processes**
  - **Requirements**: *From:* fix set of requirements;  *To:* evolving requirements & user role throughout
  - **Delivery**: *From:* static waterfall model;  *To:* Agile model with user feedback driving priorities
  - **Governance**: From: Driven by Milestones & breaches ;  *To:* More frequent review- delivery focused
  - **Functional Areas**: *From:* rigor tied to documentation for single milestone;  
    *To:* rigor tied to demonstrated risk and delivery of capabilities

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1 Year Effort involving former DSB Chairman, former AT&L, former CIO, former Army SAE, former DARPA Director…
DSB Model Impact on Development

**Agile**
- Incremental & Iterative Delivery
- Presentation / User Interface
- Business Logic / Services
- Database / Integration
- Development Team
- 2-Oct, 30-Oct, 30-Nov, 30-Dec
- Iteration
- Iteration
- Iteration
- Data generated and used to calibrate the plan

**Waterfall**
- Integration & “Big Bang” Delivery
- Presentation / User Interface
- Business Logic / Services
- Database / Integration
- Development Team
- 2-Oct
- Years Later
- Significantly Changes Workforce Dynamics
DSB Task Force Recommended Scope

IT Use by DOD

- IT to Support a National Security System
  - “Classic” NSS
    - New NSS
    - Legacy NSS
    - Cyber NSS

- IT to Support an Operational Process
  - War Fighting Process
  - Business Process

- IT to Provide a shared Infrastructure
  - Middleware
  - Data Processing
  - Common Networking
  - Commun. Satellites

Intent
- Improve Weapon System
- Improve Operational Process

Customer
- Force Provider
- Process Owner
- Infrastructure Provider

Realization Process
- DOD Milestone Process
- New IT Acquisition Process
- DOD Milestone Process
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Key Factors Key Factors (& Possible Barriers) Driving Reform

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The central feature of this model is the planned software builds – (1) **a series of testable, integrated subsets of the overall capability** – which (2) **together with clearly defined decision criteria**. Several builds and deployments will typically be necessary to satisfy approved requirements for an increment of capability.
Does Agile Have a Role in the Defense Acquisition System?

- Strengthen should cost to incentivize productivity
- Reduce cycle times - ensure sound investments
- Eliminate unproductive processes and bureaucracy
- Incentivize innovation
- Achieve affordable programs
- Remove barriers to commercial technology utilization
- Streamline documentation requirements and staff reviews
- Anticipate and plan for responsive & emerging threats
- Emphasize technology insertion and refresh in program planning
- Improve our leaders’ ability to understand and mitigate technical risk
- Anticipate and plan for responsive & emerging threats
- Promote effective competition
- Improve the professionalism of the acquisition workforce

Today’s DoD Landscape
Better Buying Power (BBP)

Federal Acquisition Regulation (FAR), DoD 5000, BBP and Emphasis Areas are Consistent With Agile
Inspiring New Test Processes

- It is expected a large portion of the test strategy for Information and Business Systems will utilize an integrated test approach.
- The degree of independent operational testing appropriate for each software increment or capability can be tailored by using the risk analysis described in the attached guidelines.
- The guidelines also permit delegation of test plan approval using the same criteria.
- Continuous test a new normal
- Capability bundles to be tested, recombined and retested
- Emphasis on enterprise evaluation (aka program of record within the ecosystem)
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Key Factors Driving Reform Across Government & Industry

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Capabilities To Support National Defense
Feedback on 1st Section 804 Pilot – Employing Agile Principles

- Approved by USD(AT&L) (Dr Carter) in 2010 and results summarized in SAF/AQ White Paper in 2013

- 1st “IT Box” JROC delegated requirements validation authority to a Combatant Command

- Created DEVOPS Environment
  - Co-located PMO and Users leveraging both development and sustainment to add value
  - Not about constraining req’ts growth but understanding ops environment and priorities

- Created a Functional Manager (peer to PM)

- Created annual Expectation Management Agreements & Capability Roadmaps
  - Planning for change within development
  - Approved by PEO and peer his within using community

- Eliminated milestones, OIPT, etc. and replaced with a regular cadence of stakeholder reviews
  - Capability adoption and requirements oversight became core oversight topics equal to cost/sch/perf

- Time between MS B and IOC reduced 5x from Increment 1 program to Increment 2 program

- Partnership (PMO, FMO, KTR) understood and communicated the consequences of change

- Provided enhanced visibility into metrics and communications across all levels

- Demonstrating that eliminating Milestone C (and its documentation requirements) did not increase the program risk
Tomorrow’s Breakout
Barrier to Further Agile Adoption

From the perspective of the Agile community…

BARRIERS TO FURTHER AGILE ADOPTION

At the agile initiative level, respondents cited organizational culture or a general resistance to change as their biggest barriers to further agile adoption, followed by not having the right skill set.

*Respondents were able to make multiple selections.

- 44% Ability to change organizational culture
- 35% Not enough personnel with the necessary agile experience
- 34% General organizational resistance to change
- 32% Pre-existing rigid/waterfall framework
- 29% Management support
- 24% Management concerns about lack of upfront planning
- 23% Business/user/customer availability
- 22% Concerns about a loss of management control
- 16% No barriers
- 15% Confidence in methods for scaling agile
- 14% Concerns about the ability to scale agile
- 13% Development Team Support
- 12% Perceived time and cost to make the transition
- 11% Regulatory compliance

From my perspective …

**Barriers to Change …**

- **60%** Lack of data documenting Return on Investment
- **40%** Lack of Guidebooks & Component guidance
- **30%** Lack DoD Training Programs
- **15%** Lack of resolve to change the current process
- **10%** Lack of workforce able/willing To change
- **24%** Management concerns about lack of upfront planning
- **23%** Business/user/customer availability
Where is DoD Heading?

- Innovation driven by commercial sector for IT
  - Dynamic cyber threat – sophisticated, always present, and indiscriminate
  - Expectations for enhanced efficiency

In Future, Expect Agile to Play A Larger Role in DoD