Observations of Agile/Earned Value Management (EVM) and Beyond

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Office of the Secretary of Defense
USD(AT&L) – DASD(C3 & Cyber)
My Perspective on EVM & Agile

• As a Government Program Manager
  • **Aircraft Avionics Systems**
    • *Major EVM thrust (field capability on C-17)*
    • *Simulation Network of Satellites & Constellation*
      • *Major software design*

• As an Industry Client Executive
  • For the National Intelligence Account
    • Led teams at NSA, NRO, DNI, etc.,
    • All teams used Agile to deliver capability

• As a Member of Defense Science Board on IT Acquisition in DoD
  • Crafted 3 chapters in final report
  • Contributor to National Academy Study on DoD IT acquisition

• As a Member of Office of the Secretary of Defense - USD(AT&L)
  • Acquisitions oversight of Intelligence Community, IT acquisitions, ERPs,
Why I believe Agile and EVM are very important for DoD’s future:

• **Agile is needed to promote efficient and rapid IT delivery**
  • Deliver timely, relevant solutions thru iterative and incremental delivery

• **EVM is needed to drive efficiency**
  • Demonstrates efficiency and provides input to needed course corrections

• **Agile is needed given unprecedented Cyber threat and its impacts**
  • Require continuous changes and upgrades across the lifecycle

• **EVM is needed to drive consistent-objective results**
  • Layers of incentives tend to drive overly optimistic promises results

• **Agile is a mainstream process used across commercial industry**
  • Highly collaborative with consistent results

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EVM is needed to overcome key barriers to modernize DoD’s IT acquisition environment and to institutionalize Agile delivery
- 1965 Brooks Act: Provided GSA exclusive IT acquisition authority across the Government
- 1988 Warner Amendment: DoD to procure IT provided it was an integral part of a weapon
- 1996 Clinger Cohen Act: DoD given acquisition authority to independently procure IT
- 2006 Section 806: Notify Congress of MAIS cancelation or significant change
- 2007 Section 811: Time certain development for MAIS
- 2007 Section 816: Codify MAIS, SAR-like and NM-like reporting
- 2008 Section 812: Pre-MAIS reporting, funds first obligated
- 2008 10 USC 2222: Obligation of funds restrictions annual IRB
- 2009 Section 817: MAIS and MDAP mutually exclusive
- 2009 Section 841: Replace IOC with FDD
- 2009 Section 811: Time certain development for MAIS
- 2010 Section 933: New Cyber process & tools
- 2010 Section 804: New IT acquisition process
- 2009 WARSA: ICE for certain MAIS when AT&L is MDA

IT Legislative Landscape
Institutional Barrier or “Encouragement” to Drive Change?

- 1996 Clinger Cohen Act: DoD given acquisition authority to independently procure IT
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: 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
Achieving Effective IT Acquisition in DoD, 12/2009

Shift to Agile Delivery Model
Integrated T&E / Voice of the End User

But Also:
Test Driven Development
• Test cases written before design and coding begin (Early Involvement!)
• Shift to 100% automated testing

Independent Test and Verification

Requirements Analysis, Re-prioritization & Planning

Architecture Refinement

Test Cases

Design

Implementation

Testing

Verification & Validation

Requirements Analysis, Re-prioritization & Planning

Independent Test and Verification

Achieving the Vision
National Academies
Advisors to the Nation on Technology, Science and Medicine

Test Driven Development

But Also:

• Test cases written before design and coding begin (Early Involvement!)
• Shift to 100% automated testing

Independent Test and Verification
Objective: Cadence of Iterative Deliveries
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
  - Improve Operational Process
- Business Process
  - Improve Business Process

IT to Provide a shared Infrastructure
- Middleware
  - Provide Shared, Trustworthy, Ubiquitous, High Performance, Low Cost IT Infrastructure
- Data Processing
- Common Networking
- Commun. Satellites
  - Infrastructure Provider

Intent
- Improve Weapon System

Customer
- Force Provider
- Process Owner
- Infrastructure Provider

Realization Process
- DOD Milestone Process
- New IT Acquisition Process
- DOD Milestone Process
What does institutionalization look like for Agile?

- It describes when something has become ingrained in the way an organization operates.
Practices are developed

Processes are acculturated, defined, measured, and governed

Level 4
- Optimized

Level 3
- Managed

Level 2
- Performed

Level 1
- Incomplete

Higher degrees of institutionalization translate to more stable processes
- Produces consistent results over time
- Used independently and inconsistent results over time
Establishing Governance (P-I-T-P):

- **People** – the human capital of the organization
- **Information** – EVM and program data
- **Technology** – Tools, systems, network
- **Processes** – building or sustaining new capability
May 24, 2012 Acquisition Decision Memorandum for an ACAT IAM (Major IT Agile Program) That is Delivering Capability to all Services

- Implement Quarterly Program Reviews (QPRs).

- Establish a Functional Manager (lead user representative) and document roles, responsibilities and processes in affected charters.

- Functional Manager shall present at every QPR on functional community issues, adoption, capability prioritization, etc.

- Implement a robust metrics collection process with metrics driven off ramps if capability is unable to deliver capability as originally promised.

- Develop a “Capability Roadmap” that documents the limited deployments decisions as well as the time-phased set of capabilities envisioned across the X program lifecycle.

- Develop “Expectation Management Agreements” that aligns the different Service components, their priorities, critical dependencies and funding expectations.
## Monthly Metrics Collection Process

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<th>Spin 2 Estimates</th>
<th>Sprint 15 Capacity (hours)</th>
<th>Sprint 15 Plan (points)</th>
<th>Sprint 15 Actual (points)</th>
<th>Sprint 16 Capacity (hours)</th>
<th>Sprint 16 Plan (points)</th>
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**Graph:**

![Graph showing metrics collection process](image)

### Single (One) Integrated Financial & Metrics System Across The Industry Prime and All Subcontractors is Important
PM Presented EVM Data at a QPR

**Performance**

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**Cost & Schedule Drivers**

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<table>
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**Trends & Projections**

Third Integrated Baseline Review (IBR) for Spin 2 was held on 29 January.

**Cost Variance (CV):**
CV is due to increased complexity of resolving the DRs compared to the planned effort, some staff has moved over to Iteration 2.

**Schedule Variance (SV):**
SV is due to the receipt of material that was purchased and received earlier than planned.

Prepared by BA25/J.
DAMIR Summary of EVM Data
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
Persistent Cyber Threat Across IT Lifecycle and Agile’s Opportunity

“The conventional DOD process for acquisition and sustainment does not address the Cyber threat that requires continuous changes and upgrades, requires 100% automated testing, requires a consistent cadence that begins in acquisition that continues in sustainment, and requires a defined role for the user (functional community) throughout an Agile-based acquisition system for information technology.”
What Agile Does To Address Cyber

Significantly Changes Workforce Dynamics

Changes Culture (& Improves Processes)

Collapses Government Roles/Participants

Speeds Delivery and Enhances Transparency
Feedback From ISSPAN Section 804 Pilot

**Generic MAIS Timeline**

- Planning Phase: 43
- Milestone B
- Build Phase: 40
- Development
- Test: 5
- Initial Operating Capability: 91

*DSB Report, 2009, Average of 32 MAIS

**ISPAN Timeline**

- Material Development Decision: 12
- Build Decision: 13
- Initial Delivery: 9
- Initial Operating Capability: 33

Reduced Acquisition Cycle Time by Two-Thirds

- Multiple stakeholders reluctant to support pilot
- Multiple milestone document staffing delays
- Value of new milestone documentation requirements
  - Full Deployment Decision (FDD) requires 11 milestone documents
- Traditional test processes delaying cycle time
  - 6+ month T&E period for a 10 month development
  - Multiple test reports for each fielding event

Raised Issues Hampering Wider Adoption

- Emphasis was on 2 sets of metrics collection:
  a. Program Content; b. Spend Analysis
- Functional Manager is essential ... changed the dimension from constraining requirements growth to better understanding the needs of the user
- Requires a new mindset with PM & PEO
  - Acceptance of Functional Manager
  - Expectation Management Agreements
  - Capability Roadmaps

Identify Disincentives in Future Adoption

- Increased User (COCOM) decision-making role via quarterly program reviews & prioritizing spiral capability
- Changed the oversight and governance via replacing “trip wire” oversight to more frequent less formal involvement
  - Changed insight to contractor performance
- Contributed to changing AF staffing processes
- Brought forward test/evaluation & integration activities
- Increased transparency & accountability

Improved User Involvement & Processes
Institutionalizing Agile & EVM

Rapid and Efficient Delivery

What to do to achieve the capability

How to accomplish the goal

How to implement the practice

Program X

Objective Evaluation

Periodic Deliveries

EVM Metrics

Agile Practices

P-I-T-P

EVM Maturity Elements

Agile Maturity Elements
The Future
Doing Nothing is Not an Option

- Dynamic cyber threat – sophisticated, always present, and indiscriminate
- Innovation driven by commercial sector
- Information systems exist in a domain where change occurs rapidly
- Warfighter and business “Expectations” for the latest IT tools will not diminish

EVM is needed to overcome key barriers to modernize DoD’s IT acquisition environment and to institutionalize Agile delivery
Contact Information

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