Emerging Information Technology Acquisition Process Changes
“Fourth, there are great benefits to be gained – in cost and efficiency – from taking advantage of economies of scale. The problem is that too many parts of the department, especially in the information technology arena, cling to separate infrastructure and processes. All of our bases, operational headquarters and defense agencies have their own “IT” infrastructures, processes, and application-ware. This decentralization approach results in large cumulative costs, and a patchwork of capabilities that create cyber vulnerabilities and limit our ability to capitalize on the promise of information technology. Therefore, I am directing an effort to consolidate these assets to take advantage of the Department’s significant economies of scale, thereby creating savings in acquisition, sustainment, and manpower costs...

My hope and expectation is that the efforts we have launched will lead to the kind of cultural changes that over time become a part of this department’s DNA and institutional memory.”

Secretary of Defense Robert M. Gates, Aug 9, 2010
SecDef Statement on DoD Efficiencies
Vision
Achieving Warfighter Expectations

Adaptive, Responsive, Speedy Acquisitions
... Gen Petraeus
Defense AT&L
Jan – Feb 2010

- Adaptive Ecosystem
  - *Processes* responsive to dynamic operational and technology environment

- Responsive Solutions
  - User-centered *domain expertise* (tap in via social media)
  - Leverage the *latest IT solutions* available commercially and products not hard-wired at predetermined needs unable to evolve

- Speed
  - “He who learns fastest ends up making progress and wins…”
  - “Speed the process …”
GUIDELINES FOR OBTAINING GREATER EFFICIENCY AND PRODUCTIVITY IN DEFENSE SPENDING

• Mandate affordability as a requirement
• Drive productivity growth
• Eliminate redundant across portfolios
• Make production rates economical
• Set shorter program timelines
• Incentivize productivity & innovation
• Promote real competition
• Improve tradecraft in acquisition of Services
• Remove unproductive processes & bureaucracy
"The primary conclusion of the task force is that the conventional DOD acquisition process is too long and too cumbersome to fit the needs of the many IT systems that require continuous changes and upgrades. Thus the task force believes that there is a need for a unique acquisition system for information technology."

March 2009 Defense Science Board Task Force Report
DSB Chapter 6 Acquisition Model Imperatives

AS IS

**Waterfall**
Requirements – Design- Build -Test

**Capstone Events**
Milestones, PDRs, CDRs, 1-Cost Est.

**Single Delivery**

**Granular Planning**
For Entire Program

**Governance Static**
(stakeholder involvement, baselines, reporting, transparency, etc.)

**User Decision-Making**
Involvement at Ends

**Serial/long T&E at end**

**Program Centric**
Document-heavy

TO BE

**“Agile-like” Principles**
Iterative & Incremental

**Periodic Events**
QPRs, n-DRs, n-Tests, n-Cost Estimates

**Multiple Deliveries**

**Scaled Granular Planning**

**Governance Dynamic**

**User Decision-Making**
Throughout

**T&E Throughout**
(emphasis on automated test)

**Enterprise Centric**
Metric-intensive
Key Point of DSB Model
Definition Phase is Important!!!

- Early systems architecture, prototyping and related program definition is critical to enable rapid IT acquisition processes later in the lifecycle
  - Prototype, build out architecturally significant and other high risk areas prior to Build Decision
  - Leverage inherent efficiencies in IT in transforming business and mission processes
- Performance improves when a significant fraction (up to 12%) of program cost is for effective program definition phase activities

Initial requirements definition and tradeoff phase is rarely performed with sufficient rigor

March 2009 Defense Science Board Task Force Report
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

New IT Acquisition Process
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
So What Is Agile?

• Delivery Model
  Applies to purchase of IT products, custom code development, purchase of enterprise services and even hardware acquisitions

• Widely Used in Commercial
  Numerous Publications (333 Agile Software Development books on Amazon)
  - *Productivity Improvement: 88%* (Rico, 2008);
  - *Improved Speed of Delivery: 86%* (Version One, 2007)
  Conferences, Agile Magazines, Certifications

• Key Features
  • Incremental deliveries of highest priority (and most valued) capability
  • Scope iteratively refined by close developers, testers & warfighters
  • Fundamentally different requirements process
  • Highly collaborative
  • Continuous test & evaluation with emphasis on automated testing
Agile Vs. Waterfall

**Waterfall**

- "Big Bang" Delivery
- Development Team
- Presentation / User Interface
- Business Logic / Services
- Database / Infrastructure

Years Later

**Agile**

- Incremental & Iterative Delivery
- Development Team
- User Interface
- Business Logic / Services
- Database / Infrastructure

**Significantly Changes Workforce Dynamics**
Achieving the Vision
Center for Strategic and International Studies (CSIS)

CSIS Study on Delivering Net Centric System-of-Systems, 9/30/2010
... Headed by Ken Krieg, former USD(AT&L)

Problem: Stove-piped, program-centric and Component-centric systems have led to ad hoc activity, lack of flexibility and lack of resilience in face of “surprise”

Key Points/Recommendations:
• Governance is key to successful delivery
  › No organizational construct exists to assess and guide “enterprise” performance (like a Board of Directors with authority to make trades)
  › Successful delivery of capabilities require that interests at the system/component level be re-balanced around the capability-centric view
• Absence of enterprise risk assessment, risk management strategies and enterprise metrics/goals (First enterprise milestone in acquisition is “IOC”)
• Iterative involvement of warfighter in all stages of delivery is critical but rarely occurs because it is rarely required

Shift Governance From “Program-Centric” to “Capability-Centric”
Why is this the Right Approach
Seems to be Consistently Supported By Others

- **Acquisition**
  - Long acquisition cycle-times (91 months)
  - Successive layers … built over years
  - Limited flexibility and agility

- **Requirements**
  - Understanding and prioritizing requirements
  - IT requirements are overly detailed

- **Test/Evaluation**
  - Testing is integrated too late and serially
  - Lack of automated testing

- **Funding & Governance**
  - Program-centric, not capability-centric
  - Overlapping decision layers
    (e.g., multiple review processes)
  - Lack of customer-driven metrics
  - Funding inflexibility & negative incentives
ACQUISITION CYCLE TIME
- Waterfall process used for IT is too document intensive, time consuming and process bound to effectively respond.

REQUIREMENTS PROCESS
- Panel found that challenges with the requirements process are a major factor in poor acquisition outcomes.
- Lack of clear communication between developer and user; and industry.

TEST AND EVALUATION
- Testing is integrated too late and serially in current IT systems acquisition practices, a new test and evaluation approach that merges developmental and operational testing in a parallel fashion.

PERFORMANCE MEASUREMENT SYSTEM/FINANCIAL (OVERSIGHT)
- Performance Management structure for DoD to measure how well the defense acquisition system in delivering value to the warfighter.
This Road Seems Awfully Familiar

Previous attempts at enterprise level
• Brooks Act…..1972
  • Centralized IT acquisition & management
• CCA - Clinger Cohen Act….1996
  • Computer Chaos “Billions Wasted Buying Federal IT”
    • “Process of acquiring IT takes significantly longer than tech..”
  • Decentralized IT acquisition & management
• DoD Rapid Improvement Team…..2005
• Capability Portfolio Management …..2008
  DoD Directive 7045

Previous attempts at program level
• Agile emphasized on NCTC Railhead Proposal
  • Top IT program to fight terrorism
  • Significant Gov & FFRDC team
  • RFP Required Agile experience/Scrum expertise
• 2009 “Railhead’s $500M Colossal Failure”
  • “Collapse of the Railhead result of poor technical planning and design, potential contractor mismanagement and inadequate government oversight”
“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
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
“STRATEGY REQUIRED --The Secretary of Defense, in consultation with the Secretaries of the military departments, shall develop a strategy to provide for the rapid acquisition of tools, applications, and other capabilities for cyber warfare for the United States Cyber Command and the cyber operations components of the military departments”

(1) An orderly process for determining and approving operational requirements
(2) A well-defined, repeatable, transparent, and disciplined process for developing capabilities to meet such requirements, in accordance with the information technology acquisition process developed pursuant to section 804 of the National Defense Authorization Act for Fiscal Year 2010
Positive Trends: Major DoD Process Changes
Requirements Validation Process (JCIDS “IT Box”)

Requirements Organization & Oversight:
Determines schedule/content of capability releases based upon collaboration between users and the program manager.

Key Performance Parameters (KPPs):
The initial minimum performance levels required for the **entire** IT program. Objective values not required nor briefed.

Application and System Software Development and Acquisition:
Identify the level of effort funding to be used for the software development effort per fiscal year.

Hardware Refresh and System Enhancements & Integration:
- Identify the **total planned program** cost to deliver capability for technology refresh per fiscal year.
**Problem:** The Intelligence Community faces nimble adversaries who can take full advantage of the speed of IT innovation from commercial industry where the “end state” is not known and thus requires continual modernization consistent with the pace of technology.

**Solution:** Based upon these guiding principles, an IC Agency implemented the following acquisition process:

- Major modernizations projects are broken into increments
- Increments typically have 18-30 month duration
- Increments are subdivided into “spins/spirals” lasting typically 90-120 days or shorter
- Initial Operational Capability (IOC) achieved within each increment
- Customers prioritizes capabilities within each increment
- Use of gates, metrics and processes to create, test and deliver valued capability
- Robust risk management and governance process based upon quarterly reviews
Positive Trends: Governance Changes
User Involvement/Decision Making

Governance

R&PC

O-6 Working Group
AO Working Group

R&PC Support
JCIO

Capability Integration

User Feedback Sessions
(6 wk intervals)

Implementation

Warfighter

JFCC Space

JSpOC Director

JSpOC Tech Director

JSpOC Support Div

Ops Crews

Acquirer

ESC / CC

JMS PO

JSpOC Integrator

JMS Release Manager

Engineering

Labs

Capability Developers

3d Party

Exercise → War Games →
Ops Issues

Operational Inputs

Acquisition Inputs

JCIO – JSpOC Capabilities Integration Office
Integrated Strategic Planning and Analysis Network (ISPN) Increment 2
Acquisition Decision Memorandum Signed by Dr Carter, USD(AT&L), March 29, 2010

Purpose:
Authorizes tailoring of the Increment 2 program to achieve principles of Section 804 (of the 2010 NDAA) while adhering to DoDD 5000.01

Guidance:
• Approves a "Build Decision" replacing the traditional Milestone B decision
• Approves program to forgo a Milestone C
• Tailors the Configuration Steering Board (replaced CAE Chair with User/PEO co-chairs)
• Replaces OIPT with a co-chaired PEO/OIPT quarterly review forum
• Implements annual Expectation Management Agreement to include the spend plan, schedule, and capabilities to be delivered in the next 12-month period
• Implements annual Capability Roadmap to define time-phased set of capabilities
• Requires milestone doc to be signed within 45 days; if not, report to MDA required
• Designates ISPN Increment 2 a “Capital Program”
ISPAN Before/After
Increment 1 vs. Increment 2

Significant Actions (Realized):

• Changed the delivery model from a **single delivery to multiple deliveries**
• Streamlines execution via **eliminating milestones** and documentation
• **Changed the governance** construct across requirements, acquisition oversight and configuration
• Placed **increased accountability** in timely **decision-making** and acquisition **oversight**
• **Replaced unstable funding** environment via Capital Program (MDA must approve any $ removal)
• **Brought forward test/evaluation and integration** activities much sooner within lifecycle
• **Increased User’s decision-making role** throughout the acquisition
• Communicates to industry lifecycle of capabilities and aligns expectations for near term deliveries
• **Demonstrates viability of 2010 NDAA can be applied with no statutory change**

Significant Actions (Projected):

• Reduce initial delivery from 3+ years to 1 year; IOC from 4.4 years to 1.8 years
• Changes acquisition oversight activities across Air Force and OSD (audit-like to mentoring)
• Establishes a New Requirements Construct with a Functional Manager who is accountable for requirements maturation and accountable for dialogue among users to effectively prioritize req’ts
ISPAN Schedule

BEFORE
Over 5 Year Cycle Time

AFTER
Under 2 Year Cycle Time
Comparison of Projected Deliveries

Generic MAIS Timeline*

<table>
<thead>
<tr>
<th>Planning Phase</th>
<th>Build Phase</th>
<th>Milestone B</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>48</td>
<td>MS C</td>
</tr>
<tr>
<td>Analysis of Alternatives</td>
<td>Economic Analysis</td>
<td>Development</td>
</tr>
<tr>
<td>91</td>
<td></td>
<td>Test 5</td>
</tr>
</tbody>
</table>

* DSB Report, 2009, Average of 32 MAIS

ISPAN Timeline

<table>
<thead>
<tr>
<th>Material Development Decision</th>
<th>Build Decision</th>
<th>Initial Delivery</th>
<th>Initial Operating Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>13</td>
<td>9</td>
<td>33</td>
</tr>
</tbody>
</table>

Numbers represent time in months
Example of “New” Governance Construct
The Challenge of Integrating Technology

Management, finances, oversight, resources and authorities are spread across multiple portfolios. There is no single office to provide guidance and direction on integration and implementation of applications/services/data.
Redefining Processes & Incentives

Governance:
• PPBE – Adopt respond to change
• Requirements – Dynamic throughout
• Oversight – Continuous

Program Manager:
• Contracts – Modular; early/smaller deliverable
• Prototyping – Continuous throughout
• Transparency – Real-time visibility/data driven

Functional Processes:
• Test – Integrated DT/OT/IA/Interop testing
• System Engineering – Enterprise, TDD, MDD..
• Cost Estimating – Annual/periodic updates
• Logistics/Training – Support iterative delivery
• Technical Maturity – COTS; not driven by DoD

Infrastructure:
• Leverage enterprise capability – DISA DECCs, Test ranges, combined development and test platforms
Contact Information

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