Test and Evaluation for Agile Information Technologies

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DISA T&E
ag·ile

[aj-uh l, -ahyl]

- adjective
  1. quick and well-coordinated in movement
Agile software development refers to a group of software development methodologies based on iterative development, where requirements and solutions evolve through collaboration between self-organizing cross-functional teams. The term was coined in the year 2001 when the Agile Manifesto was formulated.
This model works very well when there is a loooooong time between user needs definition and production. For IT systems, we typically want very short time between user need definition and product delivery.
T&E in Acquisition Lifecycle

- Individual CI Verification DT&E
- Production Qualification Testing
  - AOTR
  - Independent IOT&E
  - Full-Up System Level LFT&E
- Integrated DT&E/OT&E
- Operational Tester
- Interoperability Tester
- Developmental Tester
- Increasing Operational Realism
- Increasing complexity
- Security T&E
T&E Plan – Test – Report (PTR) cycle can exceed six months!

- **4 Test Orgs**
  - DT, OT, Iop, IA
- **3 Decision Makers**
  - MDA, JS J6, DAA

T&E in the DoD
An analysis of 32 major automated information system acquisitions… the average time to deliver an initial program capability is 91 months… “

Defense Science Board: DoD Policies and Procedures for the Acquisition of Information Technology, March 2009

SEC. 804. IMPLEMENTATION OF NEW ACQUISITION PROCESS FOR INFORMATION TECHNOLOGY SYSTEMS

(a) New Acquisition Process Required- The Secretary of Defense shall develop and implement a new acquisition process for information technology systems. ...

(b) Report to Congress- Not later than 270 days

• Based on March 09 DSB report on Acquisition of IT
• Designed to include:
  – Early and continual involvement of the user;
  – Multiple, rapidly executed increments or releases of capability;
  – Early, successive prototyping to support an evolutionary approach;
  – A modular, open-systems approach
DSB-Proposed IT Acquisition Model

ICD: Initial Capability Document
CDD: Capabilities Development Document
Decision Point

Continuous Technology/Requirements Development & Maturation

Defense Science Board: DoD Policies and Procedures for the Acquisition of Information Technology, March 2009
Acquisition Management Approach for Software Development and Commercial off-the-shelf (COTS) software Integration IT programs

National Academy of Sciences: Achieving Effective Acquisition of Information Technology in the Department of Defense, December 2009
**Test Driven Development**

- Test cases written before design and coding begin (Early Involvement!)
- Mission Focused

**Independent Test and Verification**
Agile Software Development – an Industry View

The Agile System Development Lifecycle*

T&E in the Agile SDLC

What are the implications for DoD testers?

- Evolving requirements
- Continuous involvement - testers AND users
- Rapid PTR cycle
- High optempo

T&E for Agile IT
Capability T&E

- Think small!
- Focus on the prioritized requirements of the iteration
- Empowered Test Team

- Rapidly composable test plan
  - Relevant critical technical parameters
  - Relevant key performance parameters
  - Relevant interoperability measures
  - Relevant security measures

- Ready access to knowledgeable users
- Automate!

*Scott Ambler, http://www.ambysoft.com/essays/agileLifecycle.html*
• Intent: enable rapid acquisition of enhanced capabilities for the warfighter
  – Share information
  – Improve risk management
  – Eliminate duplication and reduce cost
  – Conduct comprehensive test events, faster
  – Satisfy all decision-makers
  – Better understand capabilities and limitations.

• Test designs are risk-based, mission-focused
  – Replicate the joint mission environment
  – Leverage distributed Live, Virtual, and Constructive T&E capabilities.
Other Considerations

- Agile requirements process – “JCIDS Lite”
- Early User/Beta user involvement
- I-TEMP (Information Technology – T&E Master Plan)
  - Not the same as today’s TEMP
    - Requirements, Metrics of each iteration not known
    - Resources to test each iteration not known
    - Schedules not fixed
  - Describes CT&E concept, organization roles, resourcing
- Agile TE&C
  - Responsible Test Organization
  - Capability Test Team
- Agile …
  - Oversight
  - DIACAP
  - Interop Certification
  - Fielding Decision Process.
Summary

• New IT Acquisition model is coming
• Should motivate changes to IT T&E
  – Responsive to iterative, incremental development
  – Requirements priorities evolve
  – Lean processes!
  – Test automation essential
  – Voice of the user is critical
• Teamwork!
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