Defense Information Systems Agency
Department of Defense

Test and Evaluation for Agile Information Technologies

Steve Hutchison
DISA T&E

ag·ile

[aj-*uh* l, -ahyl]

- *adjective*

1.quick and well-coordinated in movement

Dictionary.com Based on the Random House Dictionary, © Random House, Inc. 2010.

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Agile Software Development

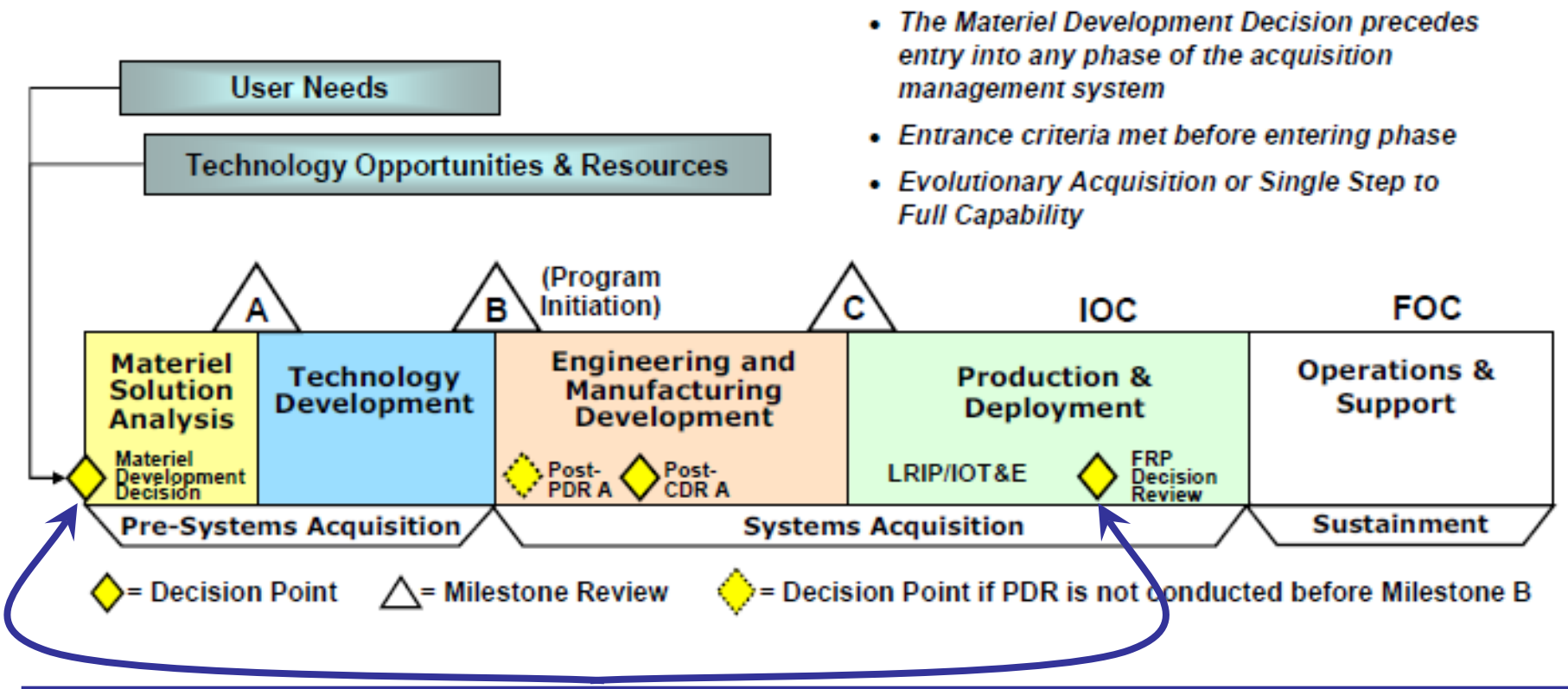
Agile software development refers to a group of software development methodologies based on iterative development, where requirements and solutions evolve through collaboration between self-organizing cross-functional teams. The term was coined in the year 2001 when the Agile Manifesto was formulated.

Wikipedia®

Acquisition in the DoD

DoDI 5000.02 (2 Dec 2008)

Figure 1. The Defense Acquisition Management System.



- *The Materiel Development Decision precedes entry into any phase of the acquisition management system*
- *Entrance criteria met before entering phase*
- *Evolutionary Acquisition or Single Step to Full Capability*

This model works very well when there is a looooong time between user needs definition and production. For IT systems, we typically want very short time between user need definition and product delivery.

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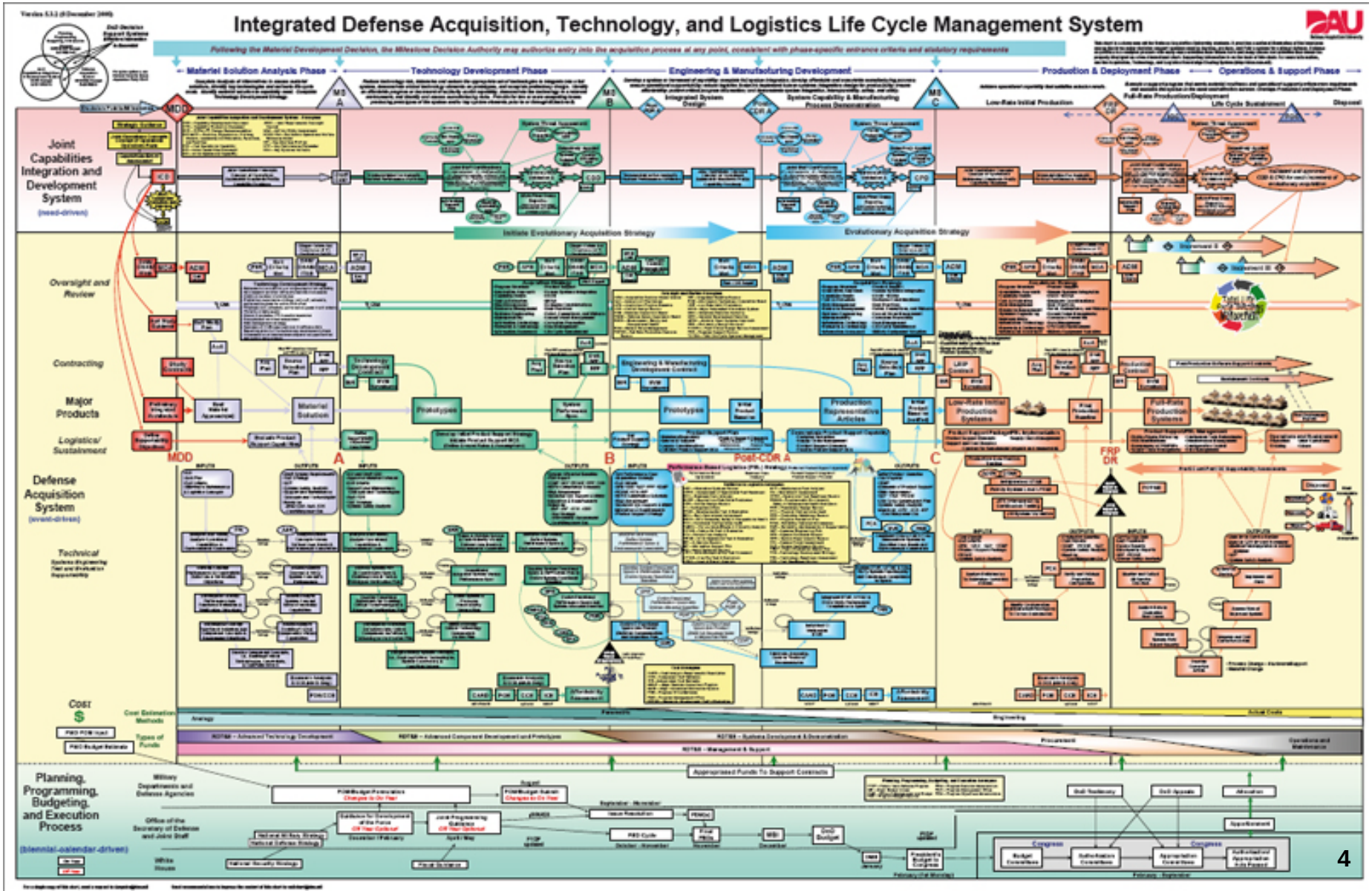
Where's Waldo?



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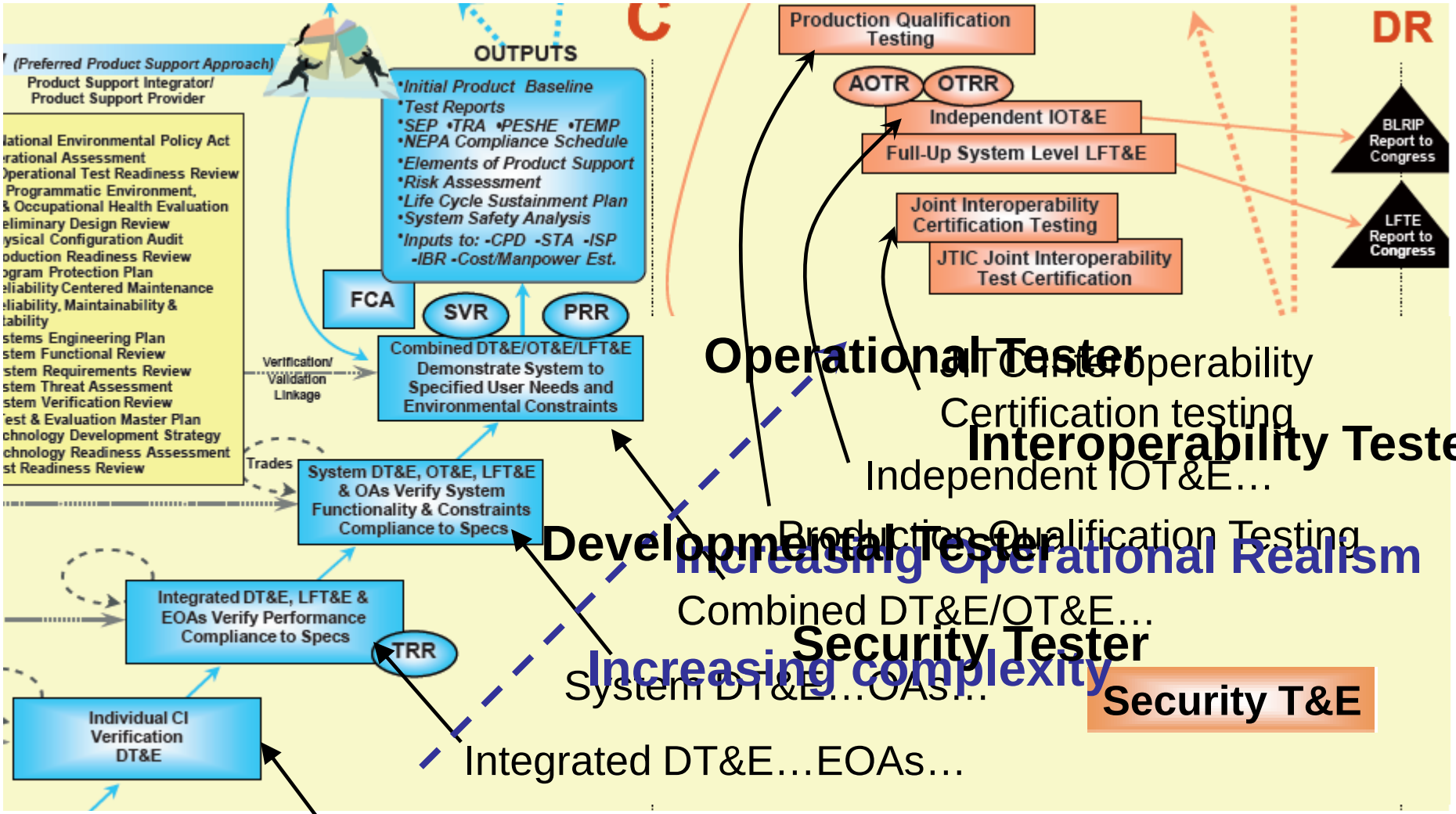
T&E in Acquisition Lifecycle



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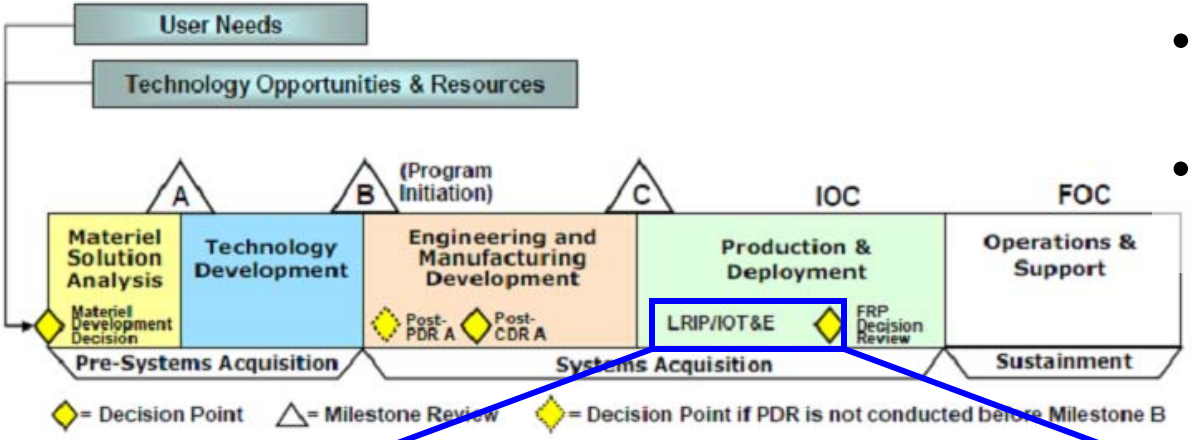
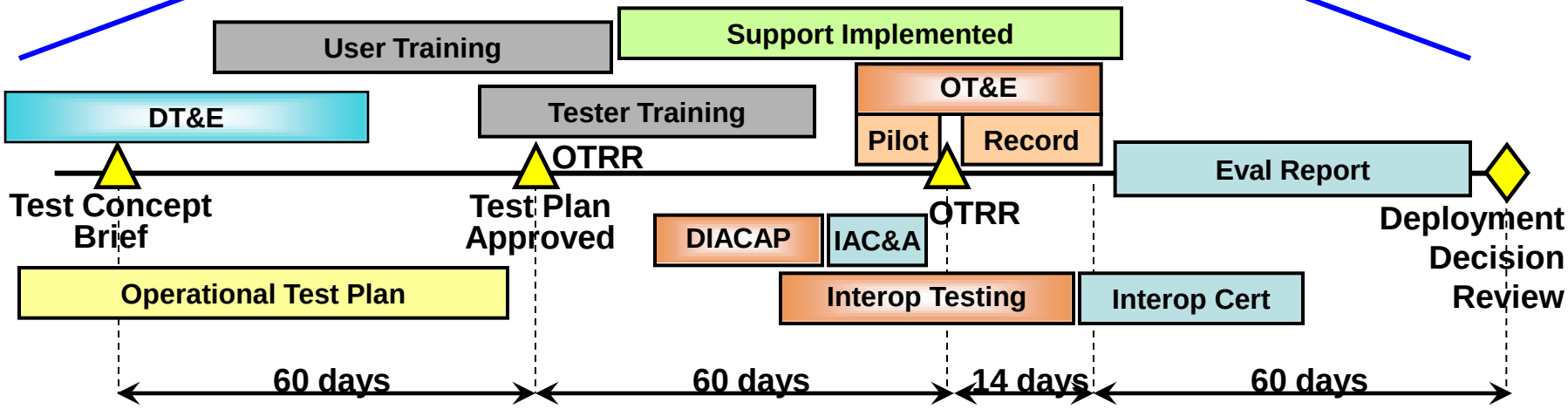
T&E in the DoD



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



T&E Plan – Test – Report (PTR) cycle can exceed six months!

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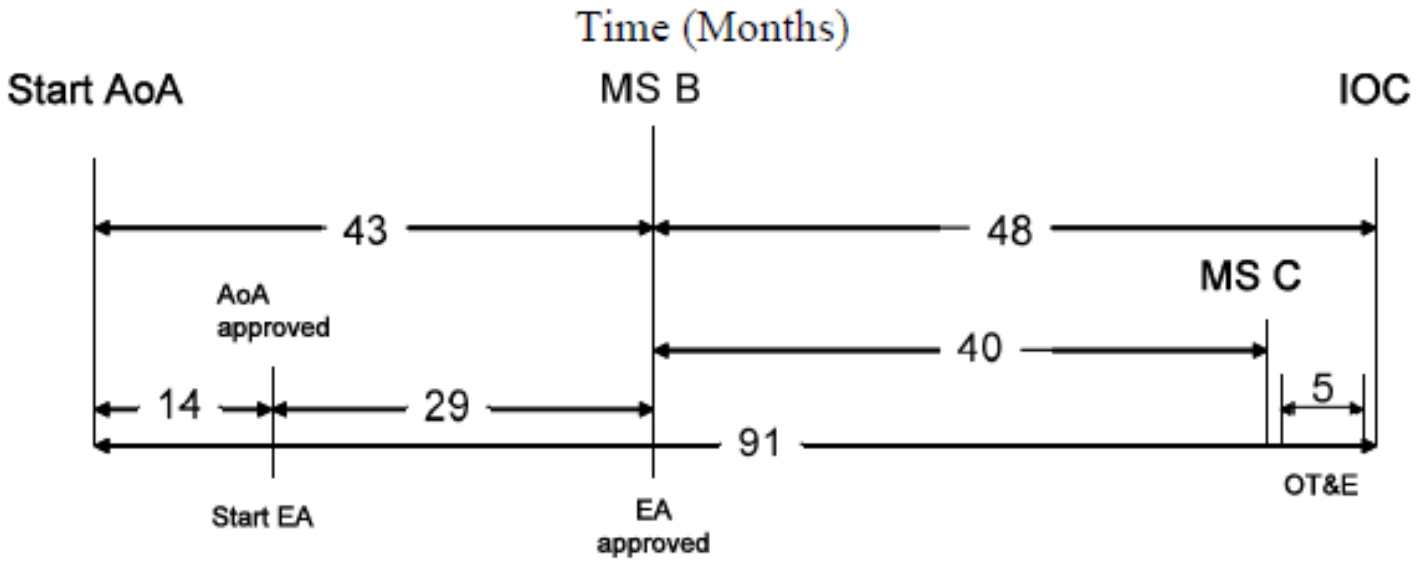
The Problem



"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

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The Solution

H.R.2647 National Defense Authorization Act for Fiscal Year 2010

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

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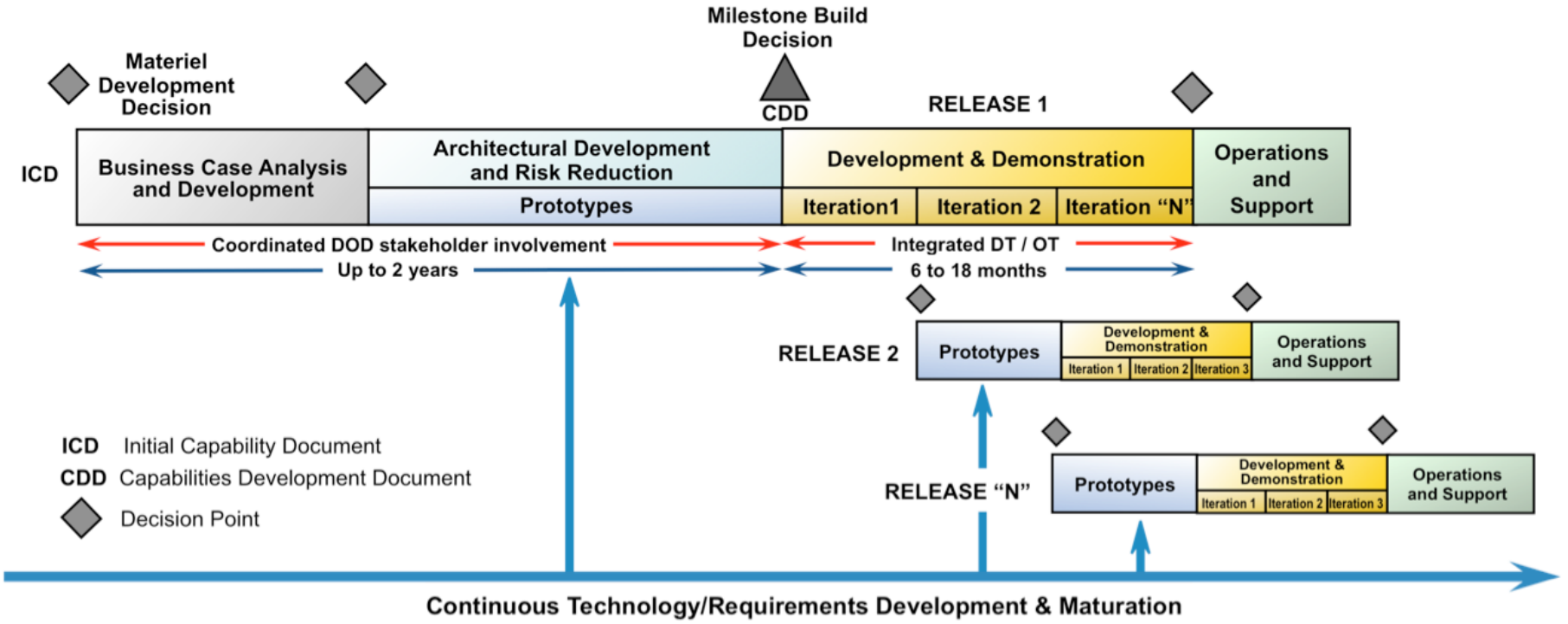
DSB-Proposed IT Acquisition Model



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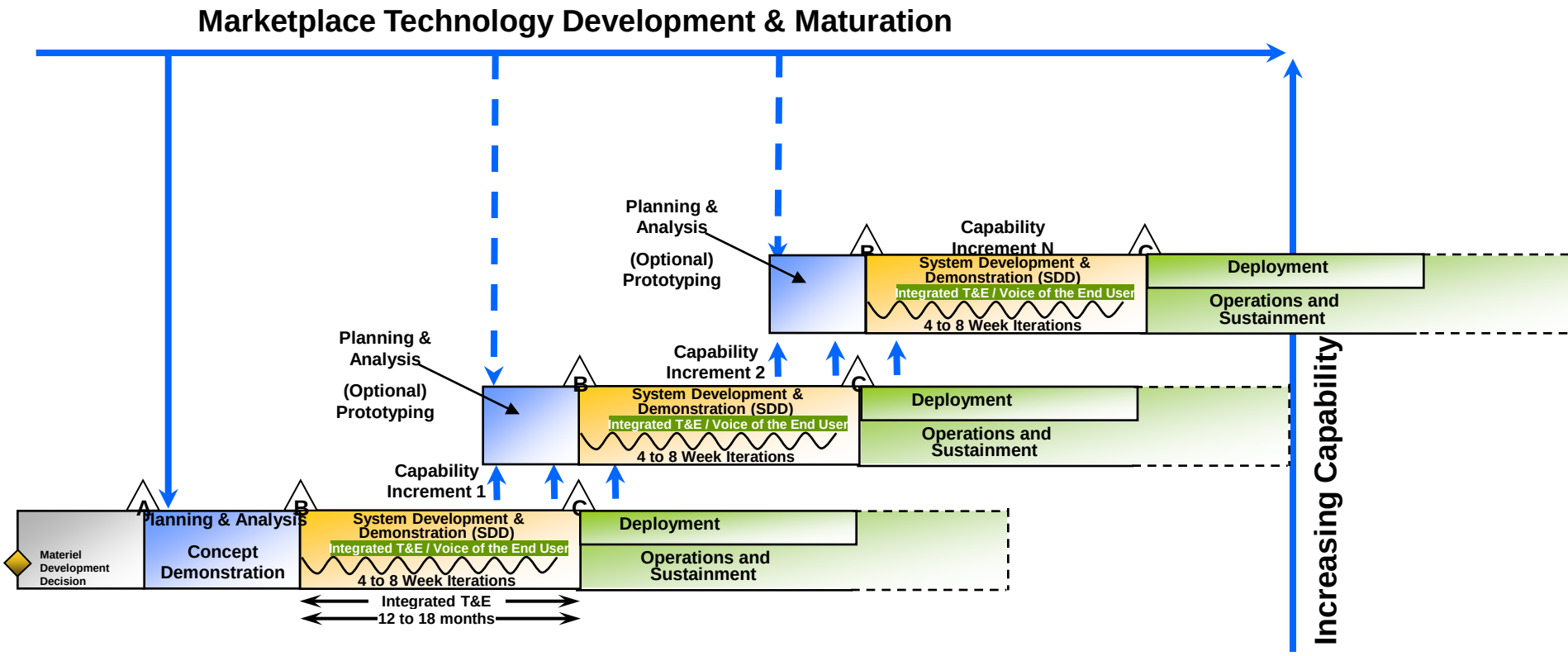
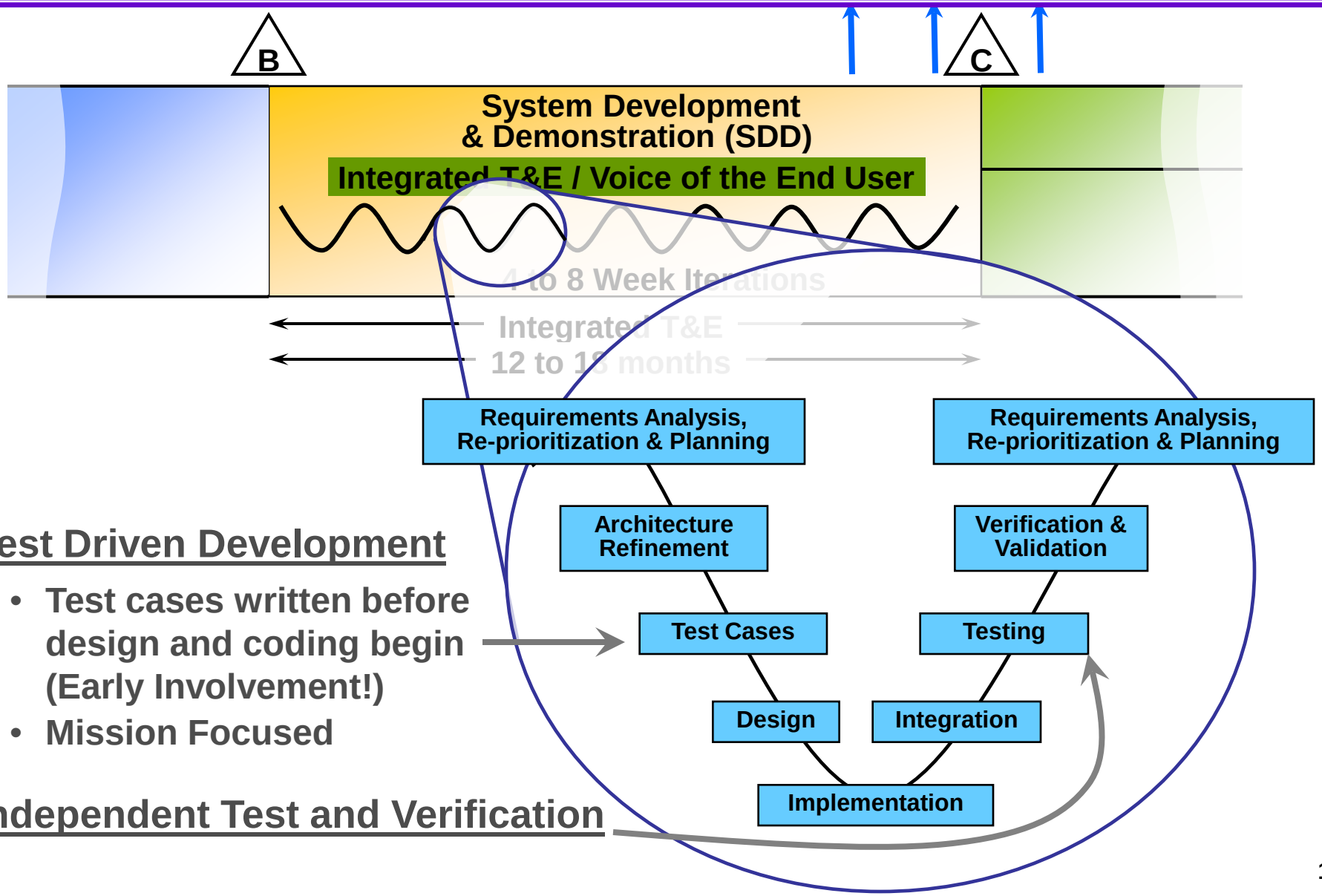
National Academies Proposal



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

NAS Model - Details



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

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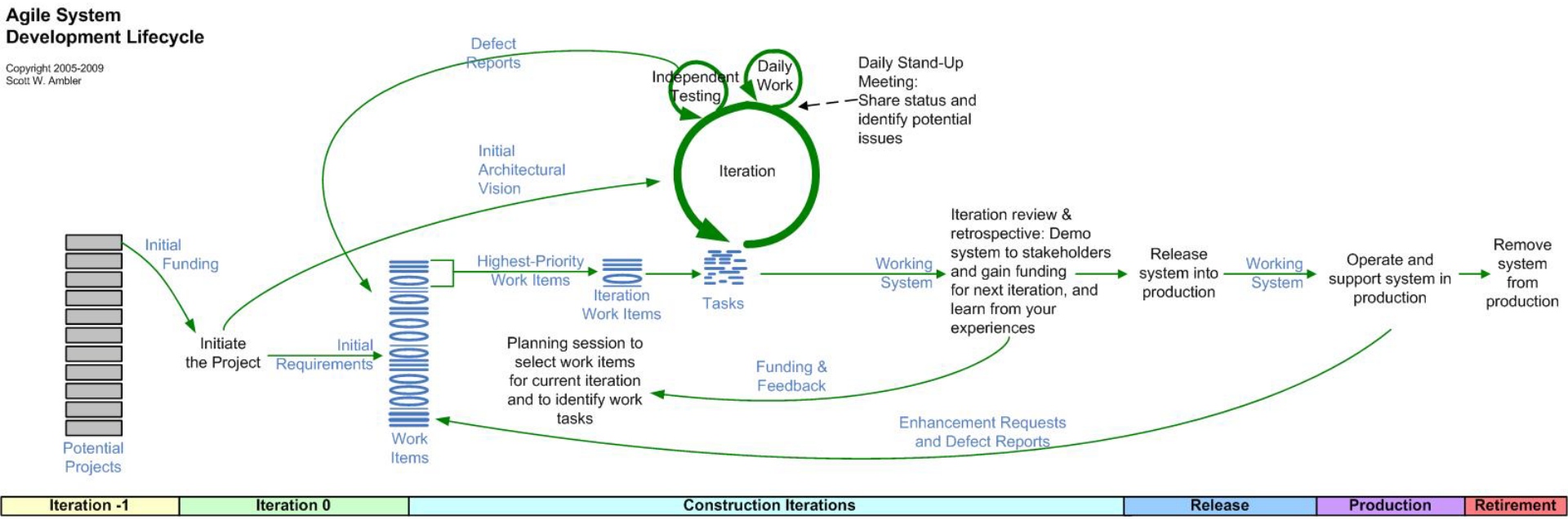


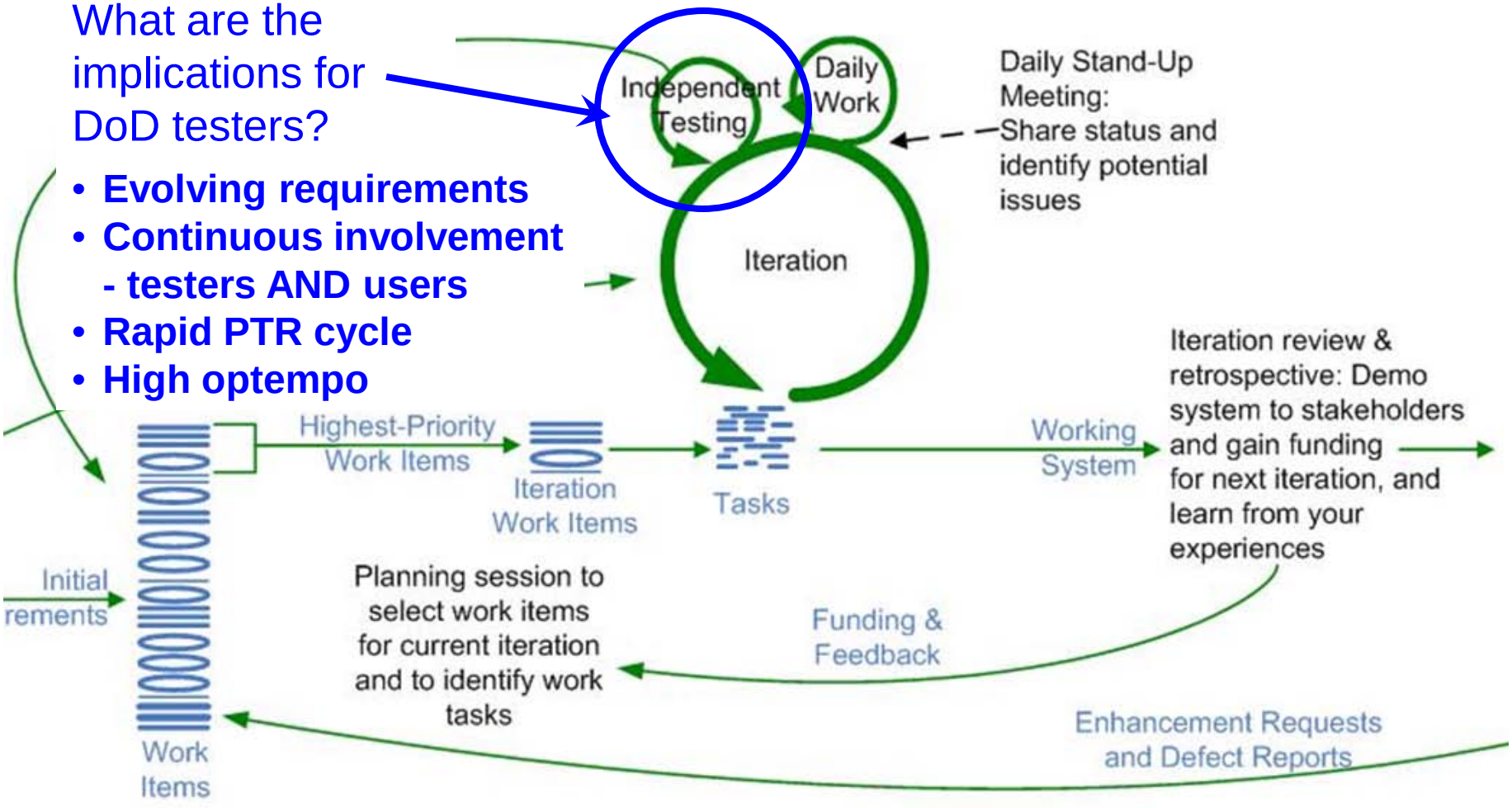
The Agile System Development Lifecycle*

*Scott Ambler, http://www.ambysoft.com/essays/agileLifecycle.html

T&E in the Agile SDLC

What are the implications for DoD testers?

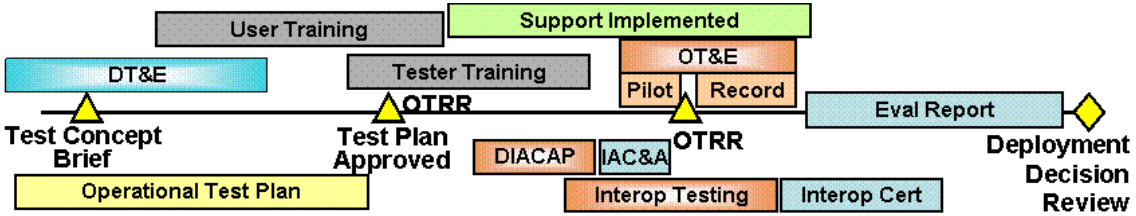
- **Evolving requirements**
- **Continuous involvement - testers AND users**
- **Rapid PTR cycle**
- **High optempo**



*Scott Ambler, http://www.ambysoft.com/essays/agileLifecycle.html

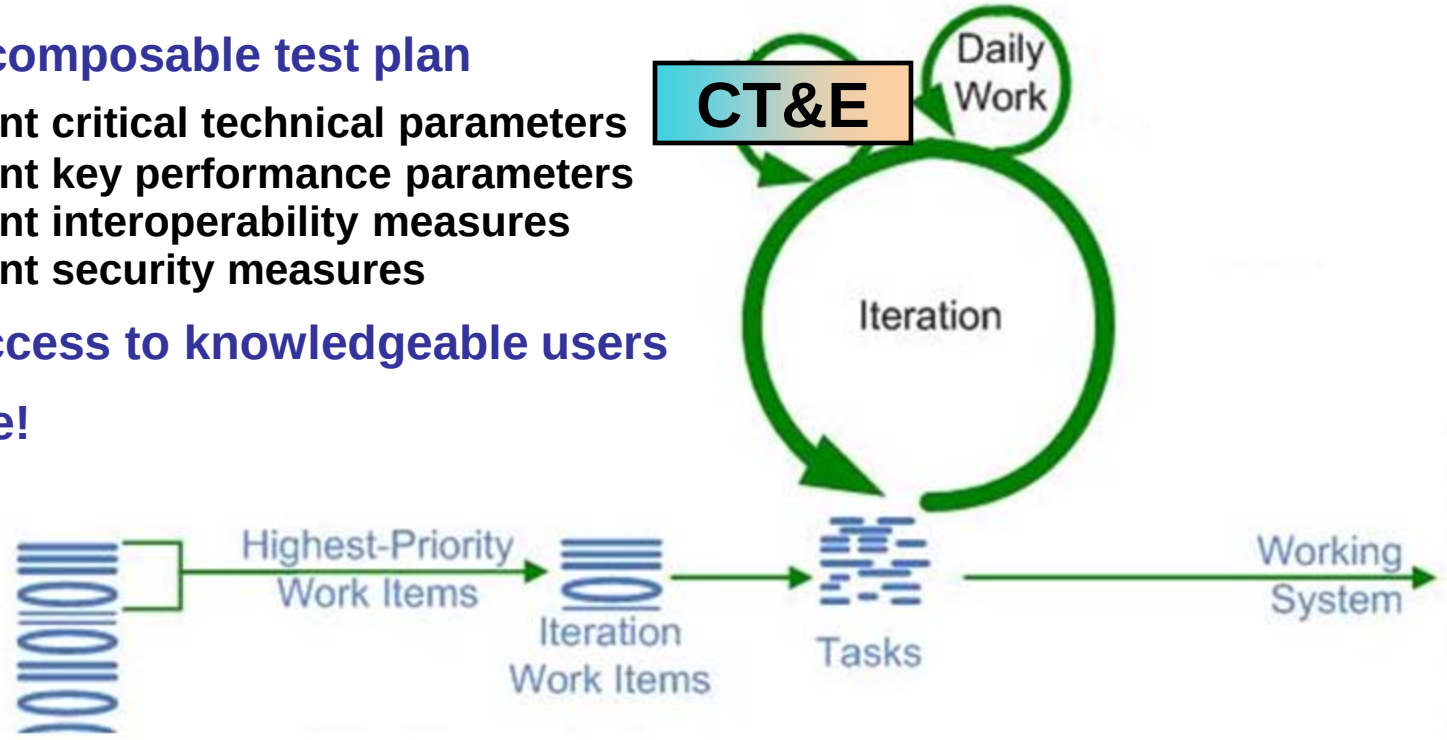
T&E for Agile IT

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!**



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Capability T&E

- 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.

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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.

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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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