



21st Annual National Defense Industrial Association
Systems and Mission Engineering Conference

Methods for Accelerated Delivery of Capability: What Does It Take to Go Fast?

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Office of the Under Secretary of Defense for
Research and Engineering

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The Engineer's Role in the National Defense Strategy



**Remarks by Secretary of Defense
James N. Mattis
on the National Defense Strategy
January 19, 2018**

“To keep pace with our times, the department will transition to a culture of performance and affordability that operates at the speed of relevance.

Success does not go to the country that develops a new technology first, but rather, to the one that better integrates it and more swiftly adapts its way of fighting.

Our current bureaucratic processes are insufficiently responsive to the department's needs for new equipment. We will prioritize speed of delivery, continuous adaptation and frequent modular upgrades.”

Systems Are Changing



From:

- Systems built to last
- Heuristic-based decisions
- Deeply integrated architectures
- Hierarchical development organizations
- Satisfying requirements

- Automated systems
- Static certification
- Stand-alone systems

To:

- Systems built to evolve
- Data-driven decisions
- Layered, modular architectures
- Ecosystems of partners, agile teams of teams
- Constant experimentation and innovation
- Learning systems
- Dynamic, continuous certification
- Composable sets of mission focused systems

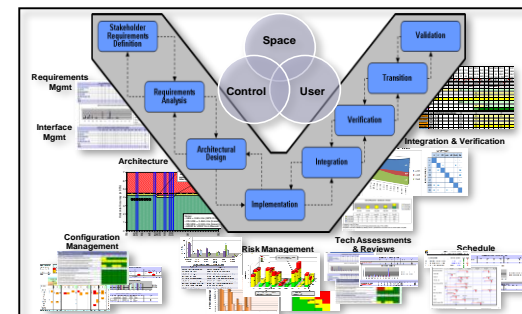
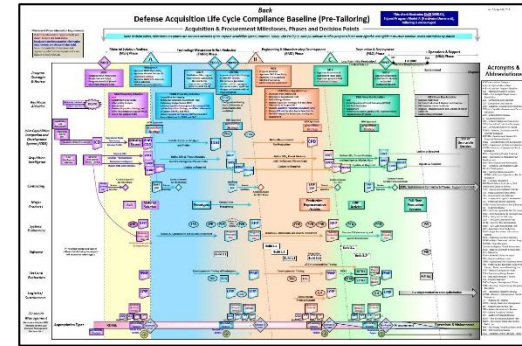
Systems Engineering Needs to Change

Credit: Derived from David Long, Former INCOSE President

Industrial Age Acquisition and Engineering Processes



- **Taylor's scientific management**
 - Empirical methods to synthesize workflows to improve economic efficiency
 - Inspires industrial and systems engineering, business process management, lean six sigma, operations research
- **Optimizing engineering and production drives need for stable requirements, well-defined processes**
- **Optimizing methods to change engineering and production requires increasing the cycles of learning:**
 - To identify necessary changes
 - To incorporate those changes into systems



Initiatives to Accelerate Change



- **National Defense Authorization Act (NDAA) for Fiscal Year 2017 – Acquisition Agility Act**
 - Modular Open Systems Approaches
 - New authorities for prototyping, experimentation and rapid fielding
 - Defining requirements likely to evolve due to evolving technology, threat or interoperability needs
- **Reorganization of USD(AT&L) – NDAA FY2017**
 - Creates separate organizations for acquisition and for innovative technologies
- **Middle Tier Acquisition Policy – NDAA FY2016**
 - Creates alternate acquisition path for rapid prototyping and fielding
- **Engineered Resilient Systems – 2011**
 - Research and development of deep trade space analysis methods to address the nature of evolving missions and threats
- **Joint Urgent Operational Needs processes – 2004**



WORKSHOP
NOVEMBER 27-28, 2018

CONTINUOUS DEVELOPMENT AND DEPLOYMENT OF MILITARY CAPABILITIES

Location: The MITRE Corporation,
7596 Colshire Drive,
McLean VA, 22102



Workshop attendance is by invitation only.

RESEARCH WORKSHOP LEADERS

Thomas A. McDermott Jr.
Deputy Director, Systems Engineering Research Center
Stevens Institute of Technology

Dr. Barry W. Boehm
Chief Scientist, Systems Engineering Research Center
University of Southern California



A recent Defense Science Board Task Force on the Design and Acquisition of Software for Defense Systems developed several recommendations targeted at more agile practices in the Department of Defense. Considering the move to an "agile at scale" transformation in DoD program offices, this workshop will discuss three key aspects toward successful transition: leading agile, continuous development and deployment of military capabilities, and building out a "digital engineering factory" concept for military systems.

LEADING AGILE: Large scale DoD projects suffer from a fragmented leadership architecture due to the multiple government and contractor relationships. The workshop will explore agile leadership practices in this domain, including agile values, continuous lifecycle management, and the fitness of the project and organizations for continuous operations.

CONTINUOUS DEVELOPMENT AND DEPLOYMENT OF MILITARY CAPABILITIES: How should the DoD architect their systems for continuous development and deployment? This is an unaddressed systems engineering challenge. Key questions include how and when to deploy minimum solutions, incorporate user feedback into the product and process, and adopt agile systems architecture standards.

BUILDING THE DIGITAL ENGINEERING FACTORY: The concept of a "software factory" or collaborative systems development cloud has been successful in some DoD programs, and will be a key part of DoD's Digital Engineering transformation. The workshop will explore extending these concepts more broadly across the DoD enterprise.

To register, please visit www.sercuarc.org/workshops or call 201-216-8300. Participation is limited. Register now.

Systems Engineering Research Center (SERC) | 1 Castle Point on Hudson, Hoboken, NJ 07030 | Phone: 201-216-8300

www.SERCuarc.org

Panelists



- **Tom McDermott**

- Deputy Executive Director,
Systems Engineering Research Center



- **Troy Peterson**

- Assistant Director of SE Transformation,
INCOSE



- **Laura Freeman**

- Assistant Director,
Operational Evaluation Division
Institute for Defense Analyses



- **Bess Dopkeen**

- Senior Analyst,
DoD Cost Assessment and Program Evaluation



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For Additional Information

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