27 Steps to Success: The DoD Acquisition M&S Master Plan

22nd Annual National Test & Evaluation Conference

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Chair, Acquisition M&S Working Group

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M&S is a Necessary Part of Acquisition

M&S is broadly useful to enable systems engineering throughout a system or S-o-S life cycle

"Help drive good systems engineering practices back into the way we do business."
Under Secretary of Defense for Acquisition, Technology and Logistics
Acquisition M&S Working Group
Established by SE Forum Feb 2005, to define a plan to solve the problems

...anchored in acquisition community, linked to industry and M&S

**Industry / Academia**
- SISO, OMG, etc.
- INCOSE
- NDIA SE Division
- SAPD, SE DSIG, etc.
- INCOSE MDSD WG
- NDIA M&S Committee

**DoD SE**
- Systems Engineering Forum
  - Chair: Mark Schaeffer
- Acquisition M&S Working Group
  - Chair: Fred Myers

**DoD M&S**
- EXCIMS
- M&S Working Group

**Products**
- Reports (e.g., “M&S Support to the New DoD Acq. Process”), standards, papers, etc.

**Product**
- Acquisition M&S Master Plan
- DoD to Implement DoDD 5134.01
A Sampling of DoD’s M&S Problems

- Minimal reuse of M&S & data; hard to discover reusable resources; insufficient info to evaluate reuse candidates; no incentives to re-use

- No contractual guidelines for M&S and data needs

- No DoD requirement for formal M&S planning to support acquisition

- Lack of agreed standards for interchanging information

- No conceptual framework for data interchange

- Many M&S tool gaps and deficiencies

- M&S developers - not M&S users - tend to drive M&S development

- No readily-available L-V-C distributed environment

- VV&A often weak or non-existent; documentation inconsistent

- No business model for developing, using, maintaining M&S capabilities

- Acquisition community managers (and staffs) are mostly uninformed about M&S capabilities and limitations

- Body of knowledge for M&S support to acquisition is deficient, not managed
Acquisition M&S Master Plan
Development Process

- **Bottoms Up:**
  - Assessed recommendations from prior studies on M&S in Acquisition
  - Assessed current issues and needs (today’s SoS efforts)

- **Top Down ( Desired Acquisition Environment):**
  - DoDD 5000.1
  - CJCSI 3170.01

- Identified gaps to better enable Acquisition M&S

- Identified actions to address the gaps for Acquisition M&S

- Identified actions of others (e.g., DMSO, NII, Services)

- Documented actions, lead organizations, and completion dates in the draft Acquisition M&S Master Plan
27 Steps to Success

- 27 Needed Actions

- Each Action
  - Rationale (Why is it needed?)
  - Discussion (What is the specific action?)
  - Lead & Supporting Organizations (Who is involved?)
  - Products (What is the product?)
  - Completion Goal [year] (When will the action be completed?)

- Execution Management
5 Acquisition M&S Objectives; 27 Actions

**Objective 1**
Provide necessary policy and guidance

1. M&S management
2. Model-based systems engineering & collaborative environments
3. M&S in testing
4. M&S planning documentation
5. RFP & contract language
6. Security certification

**Actions**
- 1. M&S management
- 2. Model-based systems engineering & collaborative environments
- 3. M&S in testing
- 4. M&S planning documentation
- 5. RFP & contract language
- 6. Security certification

**Objective 2**
Enhance the technical framework for M&S

7. Product development metamodel
8. Commercial SE standards
9. Distributed simulation standards
10. DoDAF utility
    - DoDAF 2.0 Acqn Overlay
    - Standards for depiction & interchange
11. Metadata template for reusable resources

**Actions**
- 7. Product development metamodel
- 8. Commercial SE standards
- 9. Distributed simulation standards
- 10. DoDAF utility
    - DoDAF 2.0 Acqn Overlay
    - Standards for depiction & interchange
- 11. Metadata template for reusable resources

**Objective 3**
Improve model and simulation capabilities

12. Acquisition inputs to DoD M&S priorities
13. Best practices for model/sim development
14. Distributed LVC environments
    - Standards
    - Sim/lab/range compliance
    - Event services
15. Central funding of high-priority, broadly-needed models & sims
    - Prioritized needs
    - Pilot projects
    - Expansion as warranted

**Actions**
- 12. Acquisition inputs to DoD M&S priorities
- 13. Best practices for model/sim development
- 14. Distributed LVC environments
    - Standards
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**Objective 4**
Improve model and simulation use

16. Help defining M&S strategy
17. M&S planning & employment best practices
18. Foster reuse
    - Business model
    - Responsibilities
    - Resource discovery
19. Info availability
    - Scenarios
    - Systems
    - Threats
    - Environment
20. VV&A
    - Documentation
    - Risk-based
    - Examination
21. COTS SE tools
22. M&S metrics

**Actions**
- 16. Help defining M&S strategy
- 17. M&S planning & employment best practices
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    - Examination
- 21. COTS SE tools
- 22. M&S metrics

**Objective 5**
Shape the workforce

23. Definition of required M&S competencies
24. Harvesting of commercial M&S lessons
25. Assemble Body of Knowledge for Acqn M&S
26. M&S education & training
    - DAU, DAG & on-line CLMs
    - Conferences, workshops & assist visits
27. MSIAC utility
# 5 Acquisition M&S Objectives; 27 Actions
(14 actions broader than acquisition)

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**Actions**

1. M&S management
2. Model-based systems engineering & collaborative environments
3. M&S in testing
4. M&S planning documentation
5. RFP & contract language
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**Key**
Broader than Acquisition
5 Acquisition M&S Objectives; 27 Actions
(10 actions applicable to T&E)

Objective 1: Provide necessary policy and guidance
- M&S management
- Model-based systems engineering & collaborative environments
- M&S in testing
- M&S planning documentation
- RFP & contract language
- Security certification

Objective 2: Enhance the technical framework for M&S
- Product development metamodel
- Commercial SE standards
- Distributed simulation standards
- DoDAF utility
- DoDAF 2.0 Acqn Overlay
- Standards for depiction & interchange
- Metadata template for reusable resources

Objective 3: Improve model and simulation capabilities
- Acquisition inputs to DoD M&S priorities
- Best practices for model/sim development
- Distributed LVC environments
- Standards
- Sim/lab/range compliance
- Event services
- Central funding of high-priority, broadly-needed models & sims
- Prioritized needs
- Pilot projects
- Expansion as warranted

Objective 4: Improve model and simulation use
- Help defining M&S strategy
- M&S planning & employment best practices
- Foster reuse
- Business model
- Responsibilities
- Resource discovery
- Info availability
- Scenarios
- Systems
- Threats
- Environment
- VV&A
- Documentation
- Risk-based
- Examination

Objective 5: Shape the workforce
- Definition of required M&S competencies
- Harvesting of commercial M&S lessons
- Assemble Body of Knowledge for Acqn M&S
- M&S education & training
- DAU, DAG & on-line CLMs
- Conferences, workshops & assist visits
- MSIAC utility

Key:
- Broader than Acquisition
- T&E Special Interest
Summary of Actions and Products of Interest to the T&E Community

- Establish policy and guidance:
  - To require documented M&S planning as part of the:
    - Systems Engineering Plan
    - T&E Strategy and
    - T&E Master Plan
  - For security certification of M&S activities falling under multiple Designated Accreditation Authorities (DAA)

**Products:** Revised policy and guidance in DoDI 5000.2, 8500.2; DAG; & TEMP Planning Guidance
Foster cost-effective VV&A

- Develop risk-based methodology and associated guidelines for VV&A expenditures
- Require DoD-wide standardized documentation of VV&A
- Examine a program’s VV&A when M&S informs major acquisition decisions and unambiguously state the purpose, key assumptions and significant limitations of each model/simulation when results are presented.

**Products:** Updated DoDI 5000.61; revised policy and guidance in DoDI 5000.2 & DAG; Guidance & training for oversight personnel
Summary of Actions and Products of Interest to the T&E Community (cont.)

- Enable readily-available distributed live-virtual-constructive environments
  - Examine opportunities to converge distributed simulation standards (HLA, DIS, TENA, …)
  - Establish DoD-wide standards for distributed environments
  - Foster compliance by candidate simulations, labs, and ranges

Products: A larger collection of simulations, labs, & ranges ready to be employed in distributed events
Educate and train the workforce to achieve required M&S competencies

- Provide M&S knowledge via an expanded set of DAU courses, the DAG, and on-line CLMs
- Provide VV&A training for oversight personnel

**Products:**

- Expanded set of DAU courses
- Improved M&S guidance in the Defense Acquisition Guide
- On-line Continuous Learning Modules
  - “M&S in SE”
  - “M&S in T&E”
Current Status and Way Ahead

- Completed coordination of Draft Acquisition M&S Master Plan at both the working and senior levels
- Formal DoD coordination pending outcome of Department level M&S management deliberations
- Re-chartering the AMSWG with new responsibilities:
  - Monitor and assist with AMSMP execution
  - Define and implement a process to identify and prioritize M&S needs/projects that serve a broad set of acquisition users
  - Advocate Acquisition M&S needs and recommendations at the DoD corporate level
  - Assess the state of acquisition M&S, relevant new technology, and new M&S initiatives
  - Interface with Industry to align DoD and Industry approaches for M&S
Questions / Discussion ?