



OSD (R&E), AC, ENG Mission Engineering

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DME Virtual Workshop
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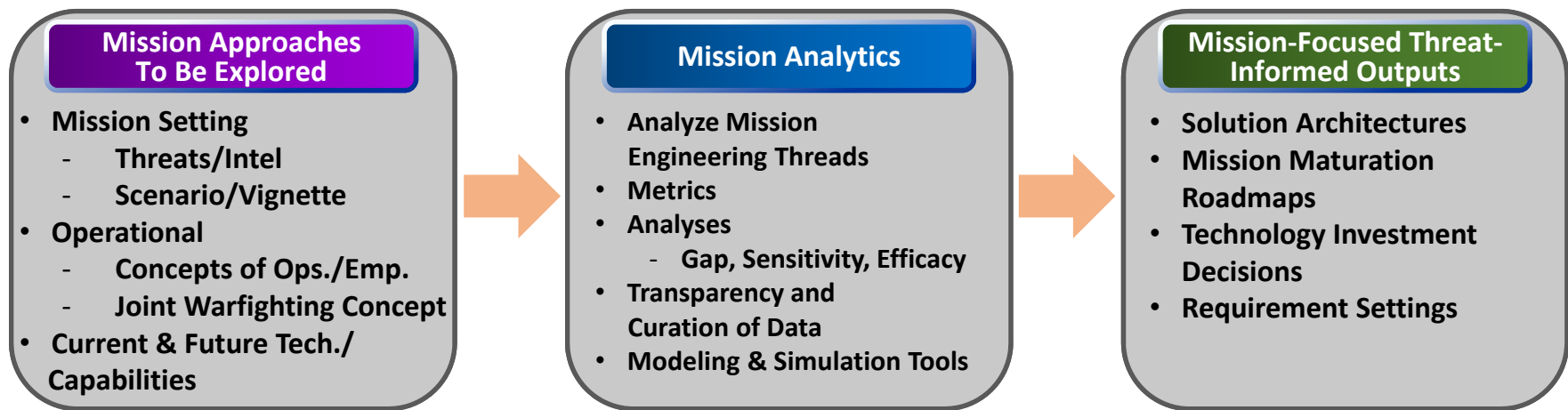
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Mission Engineering Overview



Mission Engineering provides the methodology and technical attributes for employing engineering rigor to the analysis of warfighting concepts of operation, functions, systems, and technologies in an end-to-end mission context to determine/evaluate capability solutions and shape enterprise-level investments to achieve desired mission effects.



Mission Engineering Objectives

- Mission-focused threat-informed analyses to evaluate capability solutions, advise on development of requirements and inform technology investment decisions.
- Identify enhanced capabilities, technologies, system inter-dependencies, and architectures to close mission gaps
- Provide mission concepts/ops into sets of Mission Blueprints to guide other activities
- Synchronize prototypes and systems in development to meet evolving mission needs

Method to synergize Missions - Concepts - Systems - Technologies – Budgets – Requirements

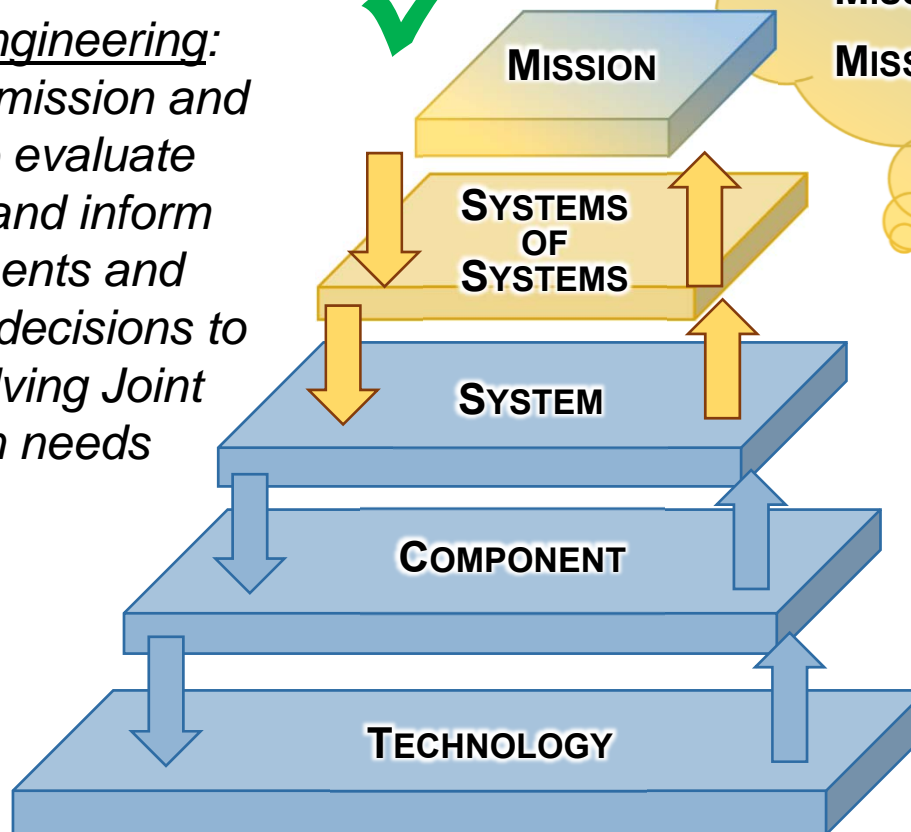


Mission Engineering vs. Systems Engineering



*Tops-Down
Approach* ✓

Mission Engineering:
focuses on mission and
threats to evaluate
solutions and inform
requirements and
investment decisions to
meet evolving Joint
mission needs



MISSION REQUIREMENTS?
MISSION GAPS?
MISSION EFFECTIVENESS?
MISSION UTILITY?
MISSION SUCCESS?

Systems Engineering:
focuses on development
and design of a system
that meets a specific set
of requirements (needs)

*Bottoms-up
Approach*



Mission Engineering analyzes Systems and Systems of Systems in a Operational Mission context



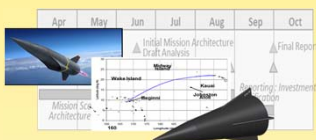
Mission Engineering Lines of Effort



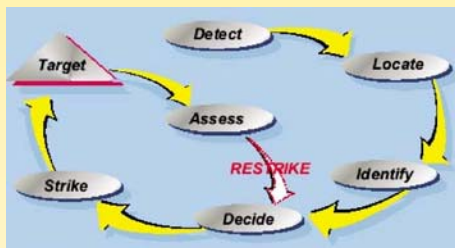
Examples of Current Mission Engineering Activities / Efforts

STUDIES

Rapid Precision Strike



Time Sensitive Targeting



Directed Energy

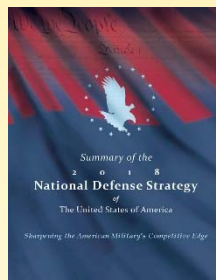


ARCHITECTURE

JADC2



R&E AD Modernization

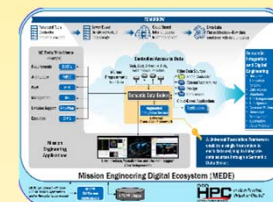


PROCESS / TOOLS

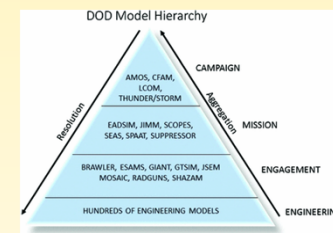
DoDI 5000.EN



Mission Engineering Guide



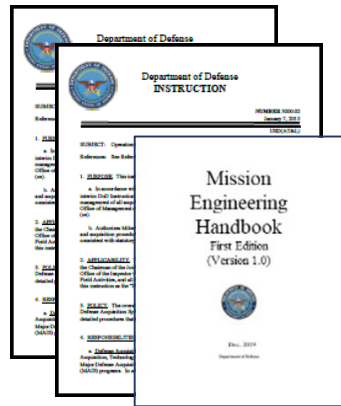
Digital Ecosystem



Simulation Tools



Mission Engineering Roles, Policy, Guidance

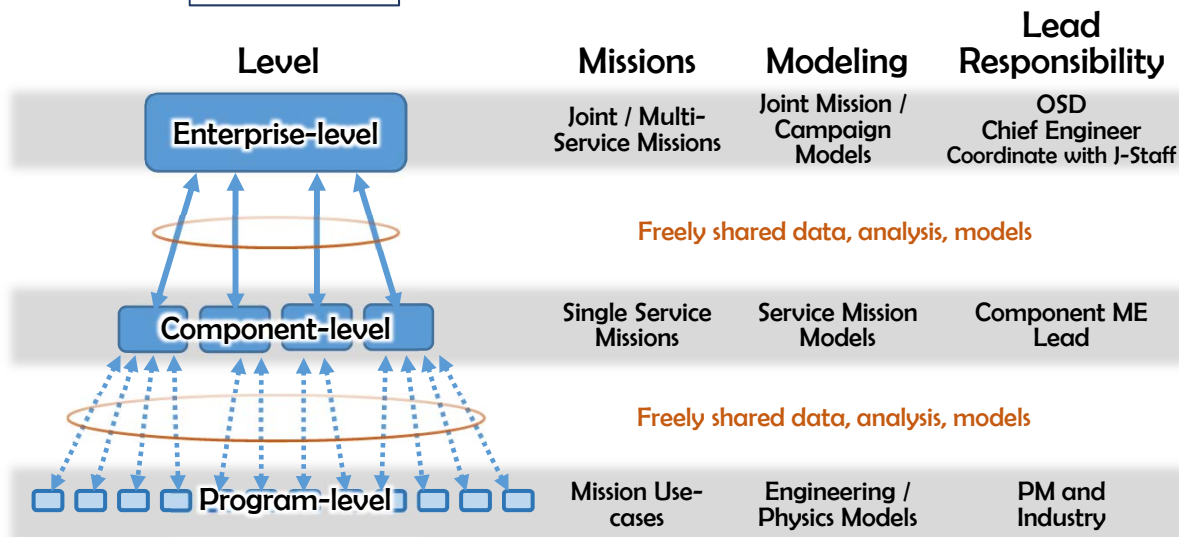


POLICY AND GUIDANCE

- DoDI 5000.02 (*Revision*)
- DoDI 5000.ENG (*New*)
- Mission Engineering Guide (*New*)

KEY TENETS

- *Applies to all Defense Acquisition System Pathways*
- *Continually assess/reassess Mission Risk, Issue, Opportunity (RIO) at decision points*
- *Programs must come with mission analyses*
- *Shared data*
- *Shared responsibility*
- *Use higher-level models when applicable*
- *Engineer lower-levels models to support higher level models*
- **TRANSPARENCY**





Mission Engineering Guide



- **Primary Audience**

- OSD, Services, and Joint Staff

- **Guide Approach**

- Focus on “what” ME is and not “how” to do ME
- Present ME in the context of attributes to consider vs. a “cookie cutter” process

- **Guide Objectives**

- Invoke critical thinking throughout the mission engineering effort
- Allows users to understand the main attributes of Mission Engineering and how to apply it to answer questions
 - Add technical/engineering rigor into analysis process
- **Adopt a common set of ME terms and definitions**
- **Promulgate “ME” best practices**

Draft Outline

- 1 Introduction
- 2 Attributes of Mission Engineering
 - 2.1 Problem Statement
 - 2.2 Basic Assumptions & Constraints
 - 2.3 Technical Infrastructure
 - 2.4 Metrics
 - 2.5 Analysis
 - 2.6 Models
 - 2.7 Output
- 3 Other Considerations
- 4 Appendices

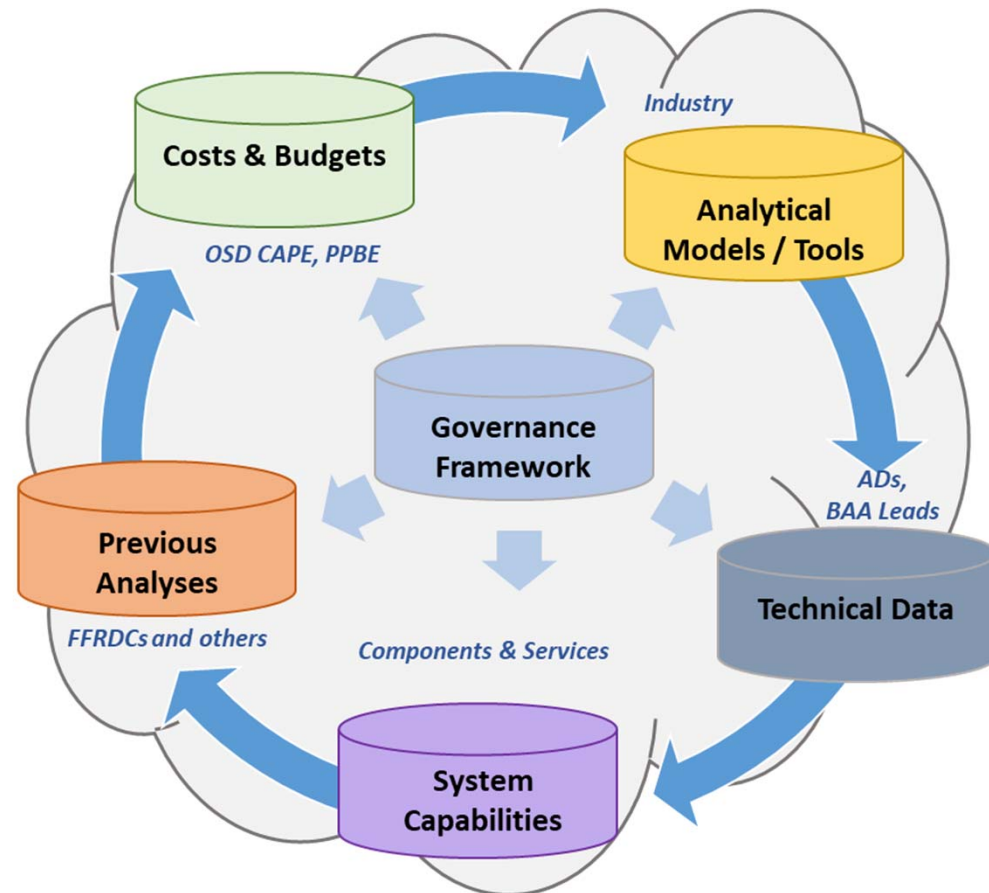




Mission Engineering Knowledge Management



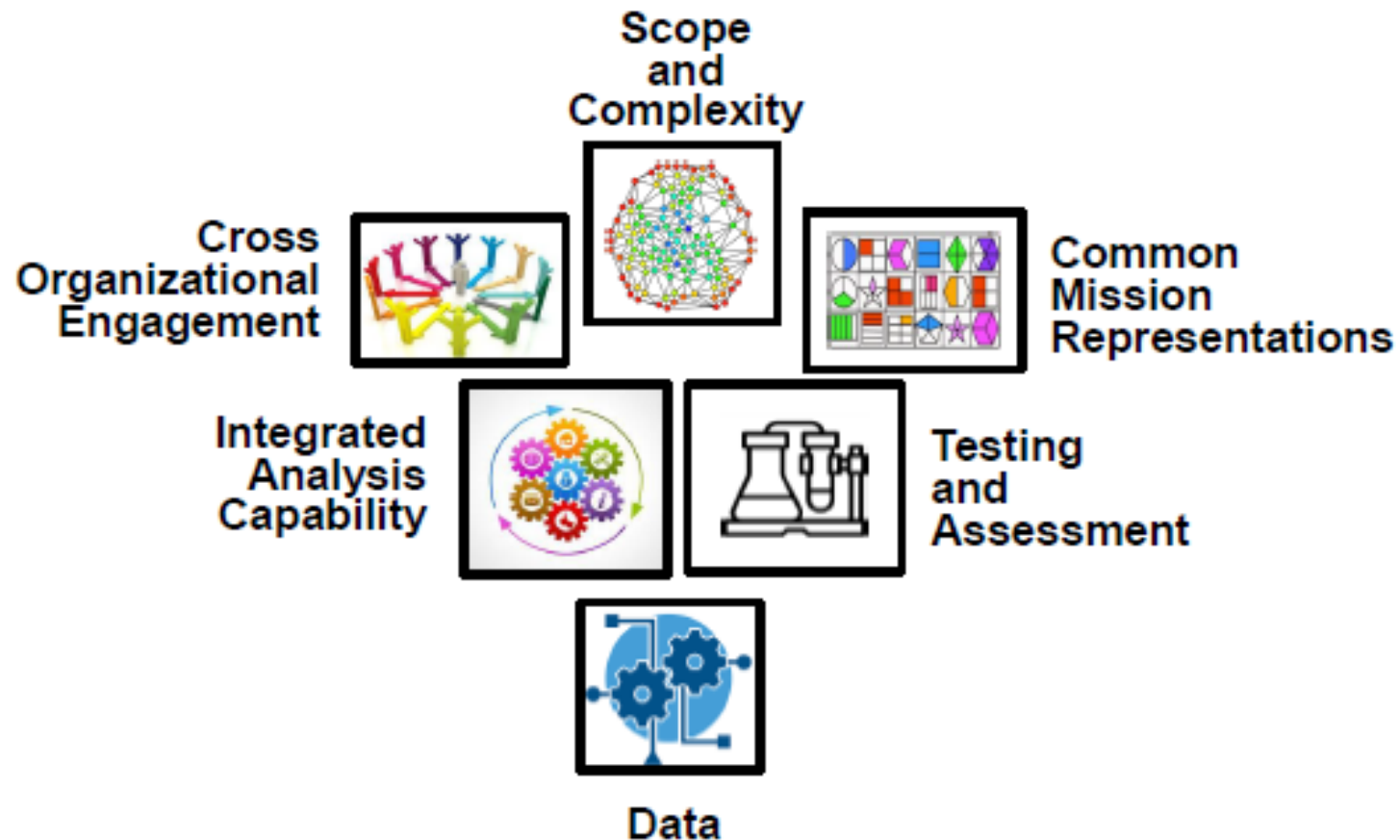
- Transparency of program performance data
- Industry-provided design models
- Increased oversight of program interdependencies
- Collaborative mission efficacy analysis
- Curation of data — accuracy of analyses depends on pedigree of data



Need collaborative environment, tailorable software tools, authoritative models, data



Mission Engineering Supported by Digital Engineering



There are many Mission Engineering challenges that can be addressed through Digital Engineering



<https://www.cto.mil>

Questions?

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***“Our mission is to ensure that we, if necessary, reestablish and then maintain our technical advantage.”
– Under Secretary Griffin, April 2018***



Further Information, Please Contact



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