



Office of the Deputy Director, Engineering *2020 Priorities*

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OUSD Research & Engineering (AC)

NDIA SE Div. Planning Meeting

Lockheed Martin Global Vision Center

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USD(R&E) Mission

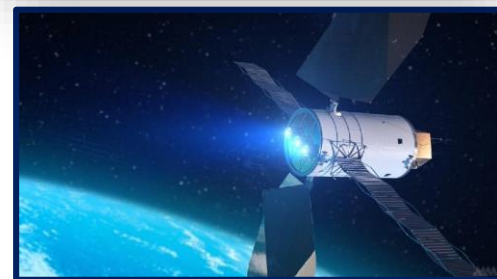
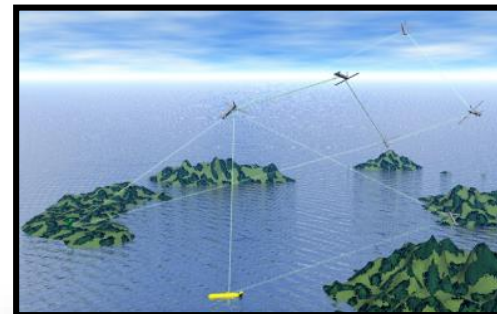


■ Ensure Technological Superiority for the U.S. Military

- Set the technical direction for the Department of Defense (DoD)
- Champion and pursue new capabilities, concepts, and prototyping activities throughout the DoD research and development enterprise

■ Bolster Modernization

- Pilot new acquisition pathways and concepts of operation
- Accelerate capabilities to the Warfighter



“Our mission is to ensure that we, if necessary, reestablish and then maintain our technical advantage.”

– Under Secretary Griffin, April 2018



Modernization Priorities

“We cannot expect success fighting tomorrow’s conflicts with yesterday’s weapons or equipment.”

– National Defense Strategy

- 5G
- Autonomy
- Biotechnology
- Cyber
- Directed Energy
- Fully Networked Command, Control, and Communications
- Hypersonics
- Machine Learning / Artificial Intelligence
- Microelectronics
- Quantum Science
- Space

For each modernization priority, a Portfolio Manager (Assistant Director) is responsible for establishing the DoD-wide, mission-focused strategy and execution plan.



USD(R&E) “Corporate” at a Glance...

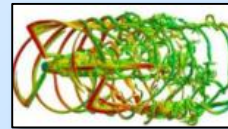
Research, Technology & Labs

- Provides affordable options for new concepts and capabilities from basic science to advanced tech.
- Oversees FFRDCs/UARCs and 63 DoD Service labs/centers
- Leads strategic outreach (Intl, SBIR, Cross-Agency)



Strategic Technology Protection & Exploitation

- Assesses and mitigates risk of loss of critical techs
- Leads Manufacturing Technology Development and the National Manufacturing Institutes
- Established Resilient-by-Design Methodologies



USD(R&E) provides leadership from concept to capability to meet the challenges of an uncertain future through advances in science, technology and innovative engineering, informed by developmental test & evaluation

Engineering

- Assesses feasibility and programmatic risk for major programs throughout the acquisition life cycle
- Establishes mission portfolios and joint open system architectures

Test Resource Management Center

- Provides adequate testing in support of development, acquisition, fielding and sustainment of defense systems; and maintains awareness of test and evaluation (T&E) facilities and resources, within and outside DoD

Developmental Test, Evaluation & Prototyping

- Advances developmental test standards and policy, assists major programs in developing test plans, and provides oversight for the developmental test community
- Identifies, develops, and demos multidomain concepts and technologies to satisfy DoD, Joint, interagency, and Combatant Command priorities
- Works within operational mission threads and obtains Warfighter feedback

Strategic Intelligence and
Analysis Cell (SIAC)

Defense Technical
Information Center (DTIC)

Defense Microelectronics
Activity (DMEA)



Engineering – FY2020 Plans



- **Balancing Priorities**

- Independent Technical Risk Assessments (ITRAs)
- Mission Engineering Support

- **Engineering Policy and Implementation**

- DoDI 5000.02 Engineering Policy rewrite
- Collaborate with A&S and Services to share technical innovations and best practices across programs
- Software Engineering

- **Increase working-level exchanges between industry and government**

- Establish Engineering Technical Fellows program



Engineering Policy -- FY2020 Activities



- **Update policies to be compliant with statute and DoD guidance memos**
 - DoDI 5000 Engineering Instruction to incorporate several enhancements to improve systems/mission engineering
 - DoDI 5000 T&E Instruction to include additional focus on integrated testing
 - Clearly defining the role of the Lead System Engineer
 - Update Existing Engineering and T&E guidance documents
- **Develop new engineering guidance (i.e. Digital Engineering, Mission Engineering)**

Develop Intellectual Property (IP) Policy

- Policy will preserve the Government's rights in IP, while protecting industry's investments in R&D and S&T



Digital Engineering Strategy Overview



■ Digital Engineering Strategy

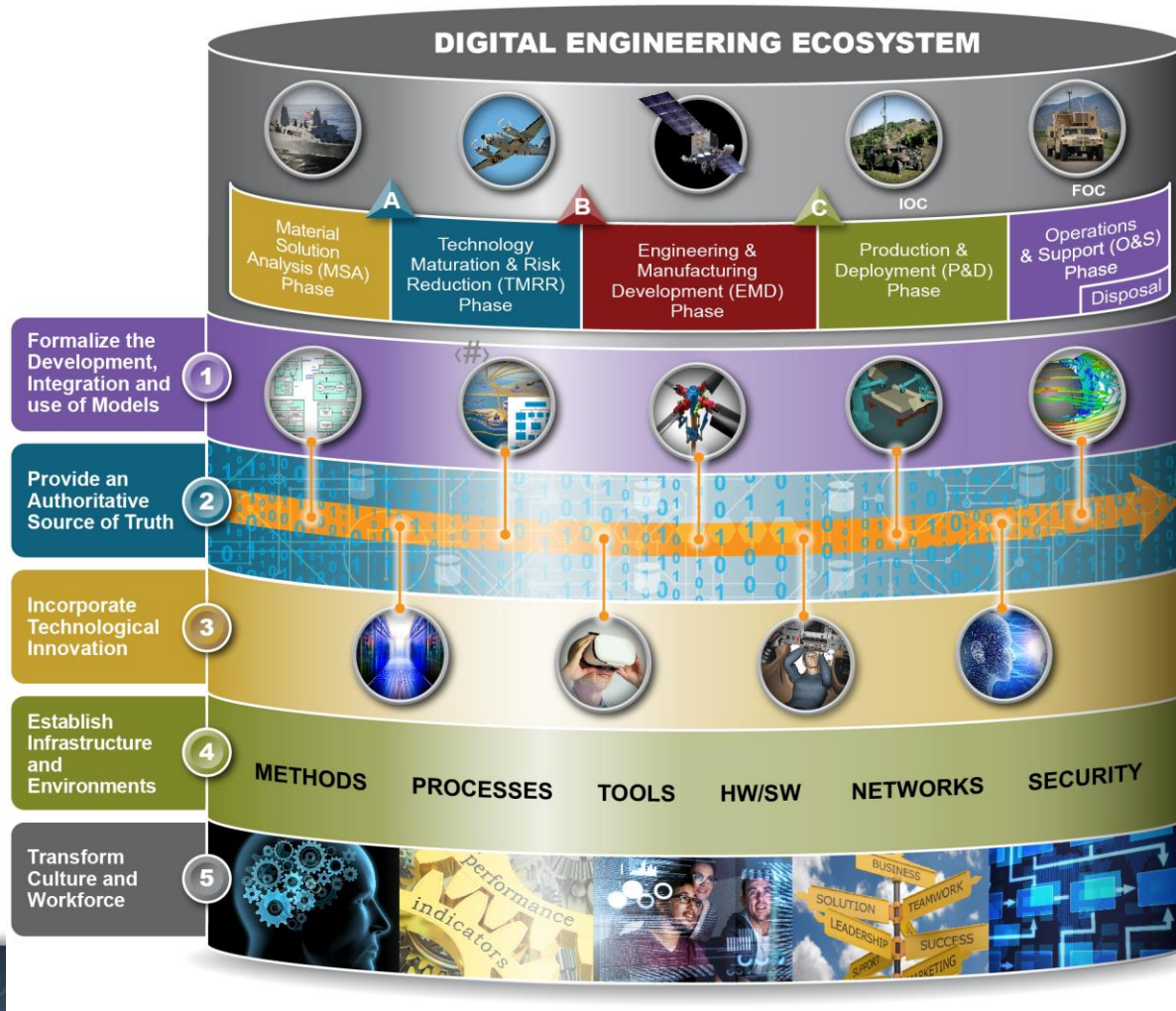
- Modernizes how we design, operate, and sustain capabilities to outpace our adversaries
- Released June 2018

■ Objective

- Sets the vision across 5 goals
- Guides the planning, development, and implementation

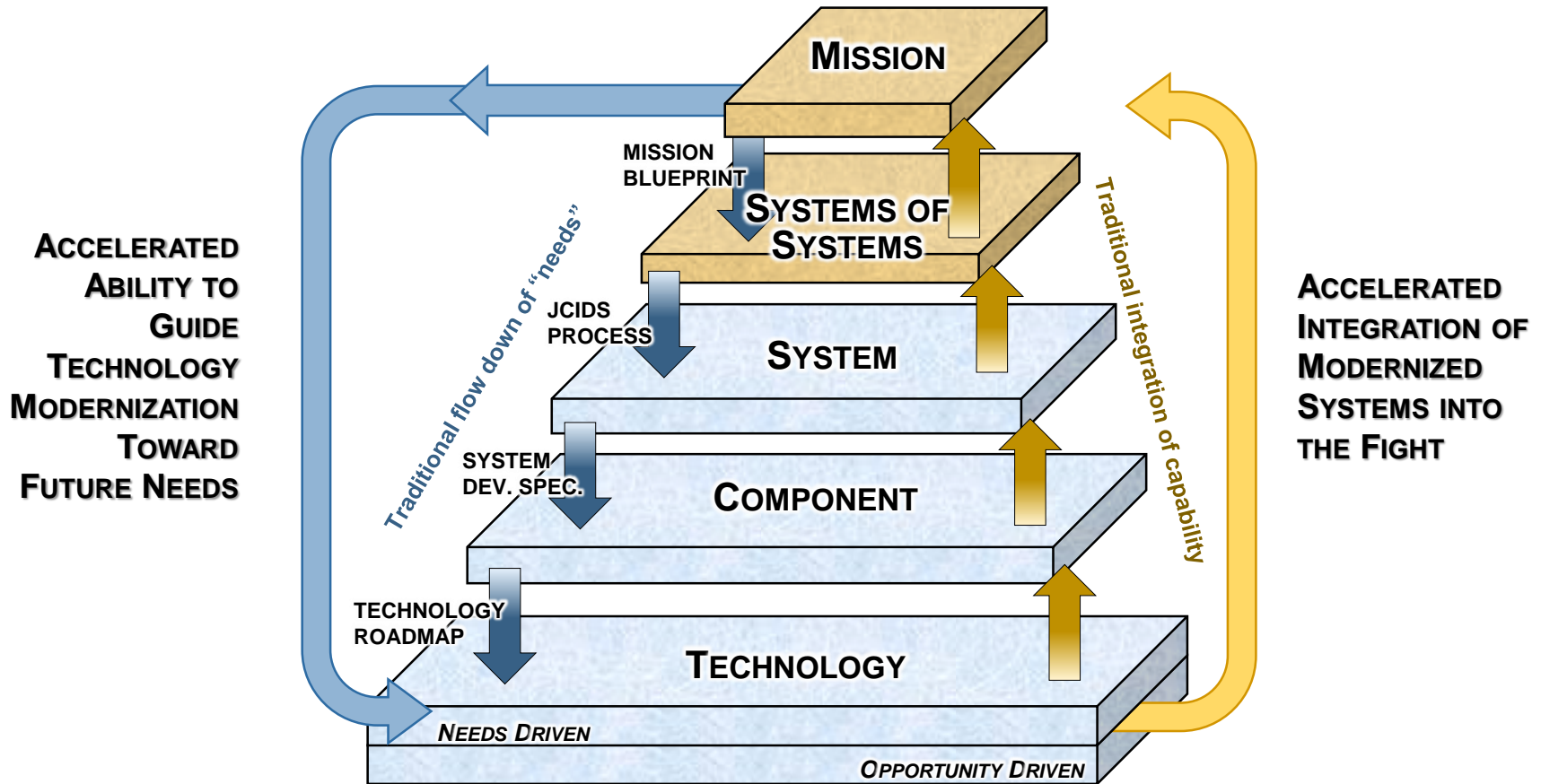
■ Expected Impact

- Reforms the Department's business practices for greater performance and agility





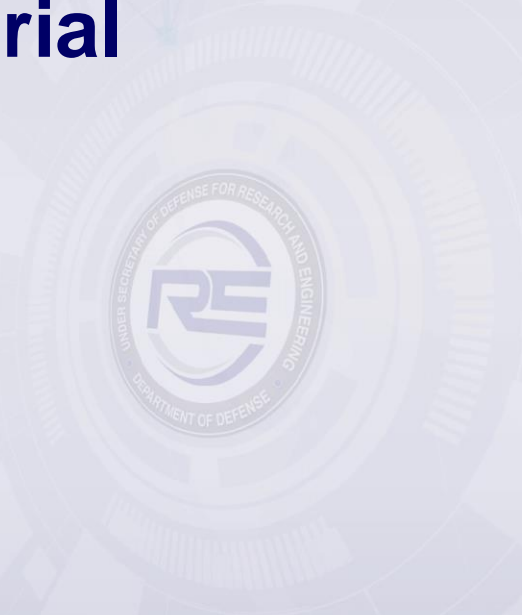
Mission Engineering: Enabling Accelerated Systems Engineering



Focus on mission vs. systems' effectiveness
Accelerated ID of technology needs; accelerated integration of technology opportunities



Back-up Material





MOSA Benefits and Approaches

- There is no single, magic bullet for implementing a Modular Open Systems Approach (MOSA)
- Determine expected outcomes up front

WHY

Interoperability
Tech Refresh
Competition
Innovation
Cost Savings

HOW

Modular Design
Defined Interface
Standards Process
Accessible Data
Open Interfaces
Intellectual
Property (IP) Rights

WHAT

Modular Technical Design Approaches

- Design severable modules
- Define interfaces between modules
- Publish consensus-based standards
- Define, standardize & describe data models

Open System Business Approaches

- Use standards & specs for interfaces
- Recognize the relevant technical community
- Acquire necessary data & IP rights



DoD Research and Engineering Enterprise



Creating the Technologies of the Future Fight



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