

# OUSD(R&E) Closing Keynote

## Tri-Service Open Architecture Interoperability Demonstration (TSOA-ID)

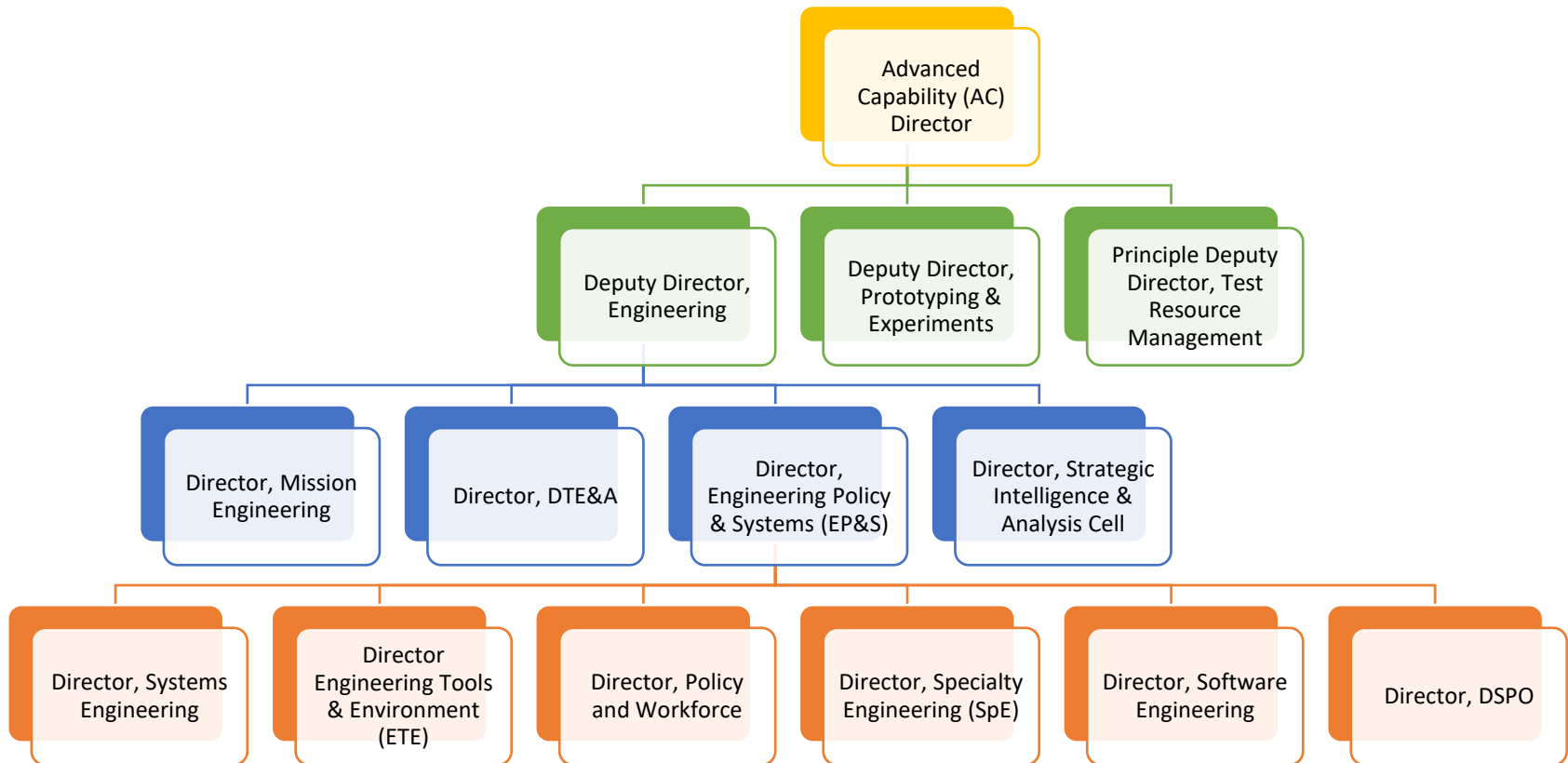
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Office of the Under Secretary of Defense for  
Research and Engineering

Washington, DC  
March 15, 2022





# DDR&E(AC) Organizational Structure





# Engineering, Policy & Systems Overview

- **Mission:**

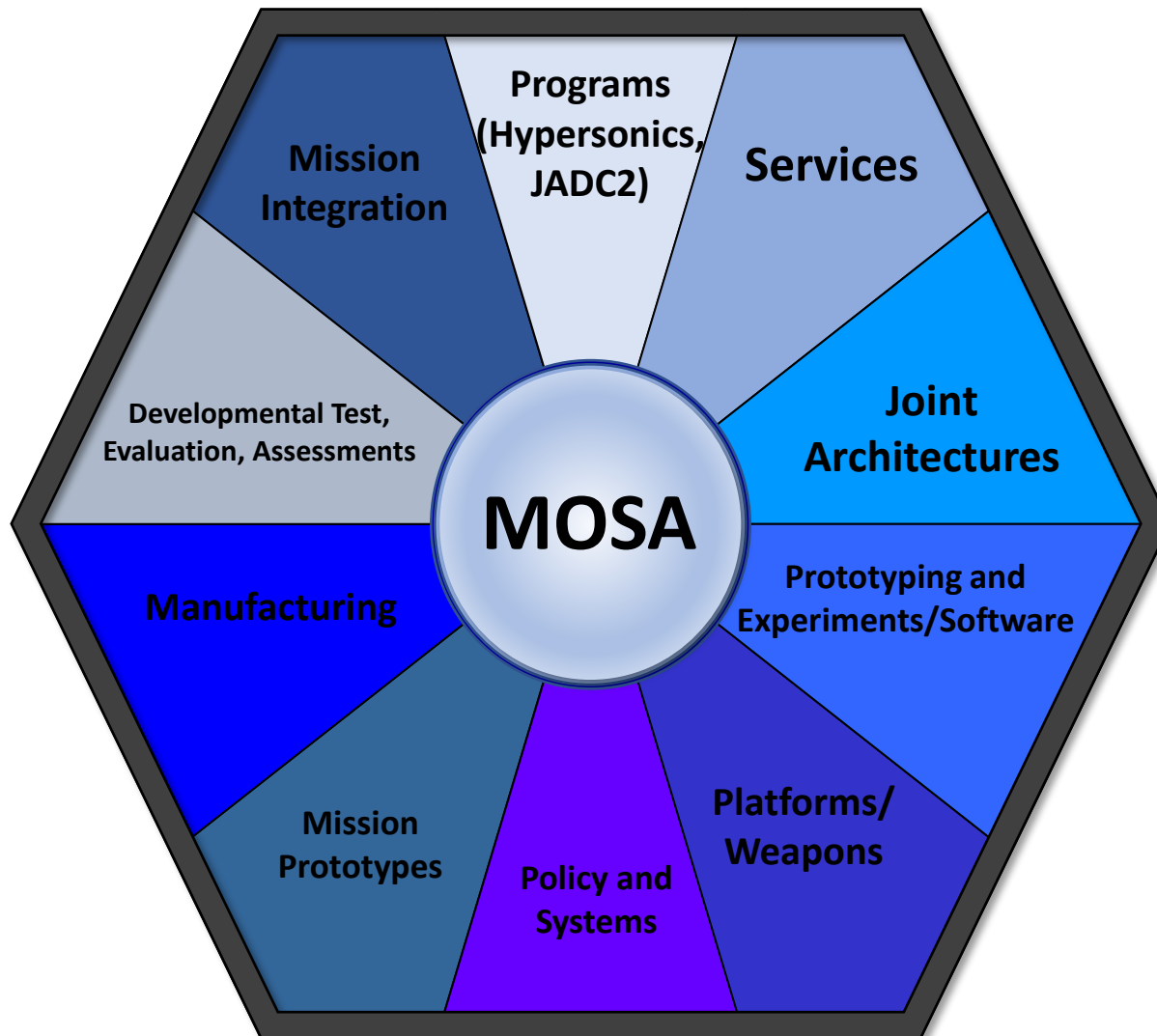
- Drive the use of innovative and modern engineering principles and techniques to get the right capabilities to the warfighter at the right time

- **Primary Efforts:**

- Establish and evolve communities of practice that connect the engineering community to solve cross-cutting engineering challenges
- Create policy, guidance, and standards that propagate engineering best practices
- Strengthen knowledge, skills, and abilities and define the education, training, experience, and proficiency standards to develop the engineering\* workforce that is essential for warfighting success
- Provide engineering expertise to support OUSD(R&E) priorities



# DDR&E(AC) MOSA Touchpoints





# MOSA Vision

## *Rapidly deliver modular and continuously adaptable systems and updates*

- Acquire systems that can be upgraded or modified to incorporate new technologies and respond to emerging threats
- Rely on architectures accessed from authoritative sources of truth that identify system components, component capabilities, the interfaces and standards used between components to identify upgradeable systems and reusable components.
- Identify standards which facilitate modularity and openness to enable consistent component replacement and interoperability
- Use relevant technology forecasts to field systems using tailorable modular and open system approaches for technology insertion that contribute to system success



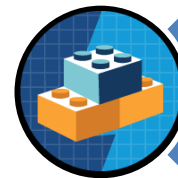
# MOSA Strategic Considerations

- **MOSA is not an all or nothing proposition**
  - Must tailor approach to expected MOSA benefits; requires tradeoffs
  - Must be addressed in all aspects of acquisition
  
- **MOSA is more than just defining architectures and selecting standards**
  - MOSA requires technical community enablers and business relationship enablers
  
- **Governance and leadership matter**
  - Leadership, and guidance applies across multiple programs
  
- **Industry must be an able and willing partner**
  - Crossing the government/industry boundary: Intellectual Property/Data Rights (IP/DR) in design, documentation, specifications, tools, etc.

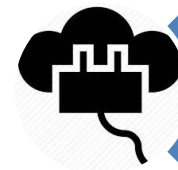


# Background and Motivation

- **Modular Open Systems Approach (MOSA)** is defined as an “integrated business and technical strategy” ... “to enable incremental development and enhance competition, innovation, and interoperability” (10 USC §2446a)
- **DoD is pursuing opportunities** to design and develop MOSA systems that can be upgraded to incorporate new technologies and respond to emerging threats



Modular and severable components that are not vendor-locked



Standardized Interfaces between modules and systems



Standard

Use of consensus-based standards



# Modular Open Systems Working Group (MOSWG)

- Identify/collect elements of the body of practice produced within current DoD and Industry efforts

- *FY15, FY17, FY18 and FY21 NDAA*
- *Data Rights / Intellectual Property Working Group WG*
- *Better Buying Power 3.0*
- *Defense Standardization Council*
- *Chief Engineers Council*

## Modular Open Systems Working Group



- Prioritize recommendations into a body of work to improve MOSA-related acquisition activities for the benefit of the stakeholders

***OUSD(R&E) Systems Engineering led the creation of a community of practice, leveraging the work to date, the talent, and the dedication of current stakeholders***





# Current MOSA Focus

- Address MOSA in all aspects of acquisition
- Establish a strong relationship between the technical and business communities
- Governance and leadership is needed across and within programs
- Manage Intellectual Property/Technical Data Rights in design documentation and architecture

## WHY

Interoperability

Tech Refresh

Competition

Innovation

Cost Savings

## HOW

Modular Design

Defined Interface

Standards Process

Accessible Data

Open Interfaces

IP Rights

## WHAT

### Utilize Technical Design Approaches

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

### Employ Open System Business Approaches

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



# Why Acquisition Agility?

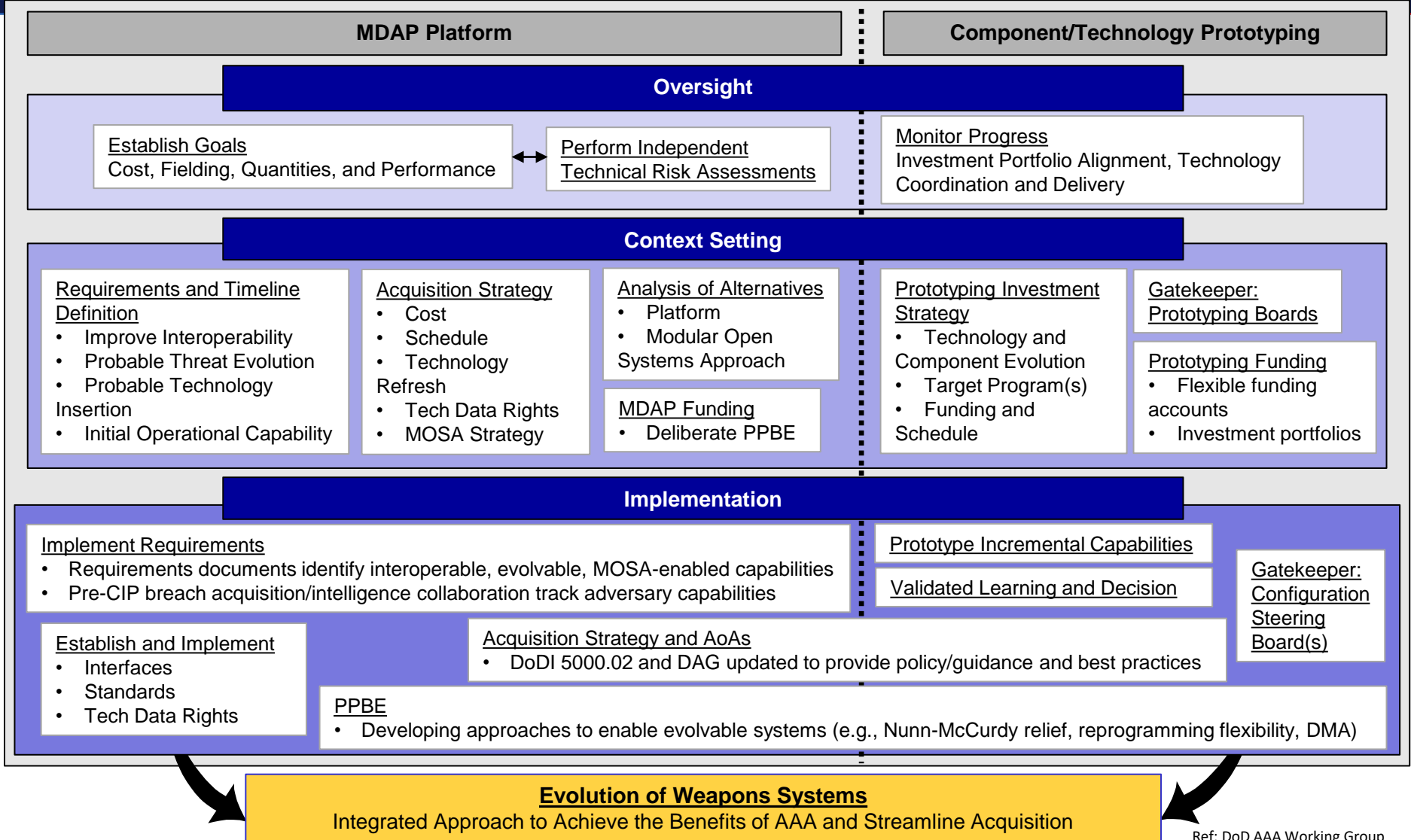
- **Conventional Department of Defense (DoD) acquisition system is “not sufficiently agile to support warfighter demands”<sup>1</sup>**
  - Current, evolving, and emerging threat environments place growing demands on the U.S. Armed Forces
  - Urgent warfighter needs for hardware and services are not being met; current processes are so rigid and time-consuming DoD is not often effectively tapping into commercial innovation
  - Challenges exist ensuring the DoD workforce is adequately trained, qualified, and experienced to make sound technical and acquisition decisions
  
- **The Acquisition Agility Act (AAA)<sup>2</sup> changes the way capabilities are acquired to remain ahead of emerging threat and take advantage of emerging technologies to reduce cost/schedule and increase interoperability**
  - Encourage modular open systems approach (MOSA) for Major Defense Acquisition Programs (MDAPs)
  - Drive changes in Joint Capabilities Integration and Development System (JCIDS) documents and Analysis of Alternatives (AoA) guidance
  - Increase transparency in MDAPs with affordability, fielding (i.e. schedule), and performance (i.e. anticipation of threat evolution, technology insertion, and interoperability) goal reporting before funds are obligated

1. House Committee Report 114-102 accompanying the National Defense Authorization Act (NDAA) for Fiscal Year 2016 (FY16)  
2. AAA is found in FY17 NDAA Sections 805-809 (10 U.S.C. §2446-2448 (P.L.114-328))



# AAA Implementation Framework

## Evolution of Weapon Systems (P.L.114-328)





# Using MOSA for Acquisition Agility

## (10 U.S.C. §2446a,b,c (P.L.114-328))

- **MDAPs must use MOSA to the maximum extent practical, and should consider the benefits/return on investment when determining if/how modularity and open systems will be incorporated into designs**
  - Evolve business strategies to maximize all available technology sources
  - Enhance architecture products to facilitate severable major system component and maximize competition
- **MOSA dramatically impacts the way the DoD will prepare program capability documents and acquisition strategies**
  - Capability document authors must designate areas where MDAP capabilities should evolve to meet changing threats, enhance interoperability, and more rapidly employ new technologies
  - Acquisition strategies will clearly layout the program's MOSA; will differentiate between platform and major components, note where the program will evolve, consider prototyping use, and discuss key intellectual property / technical data rights issues
  - Develop intellectual property strategies that capitalize on MOSA benefits



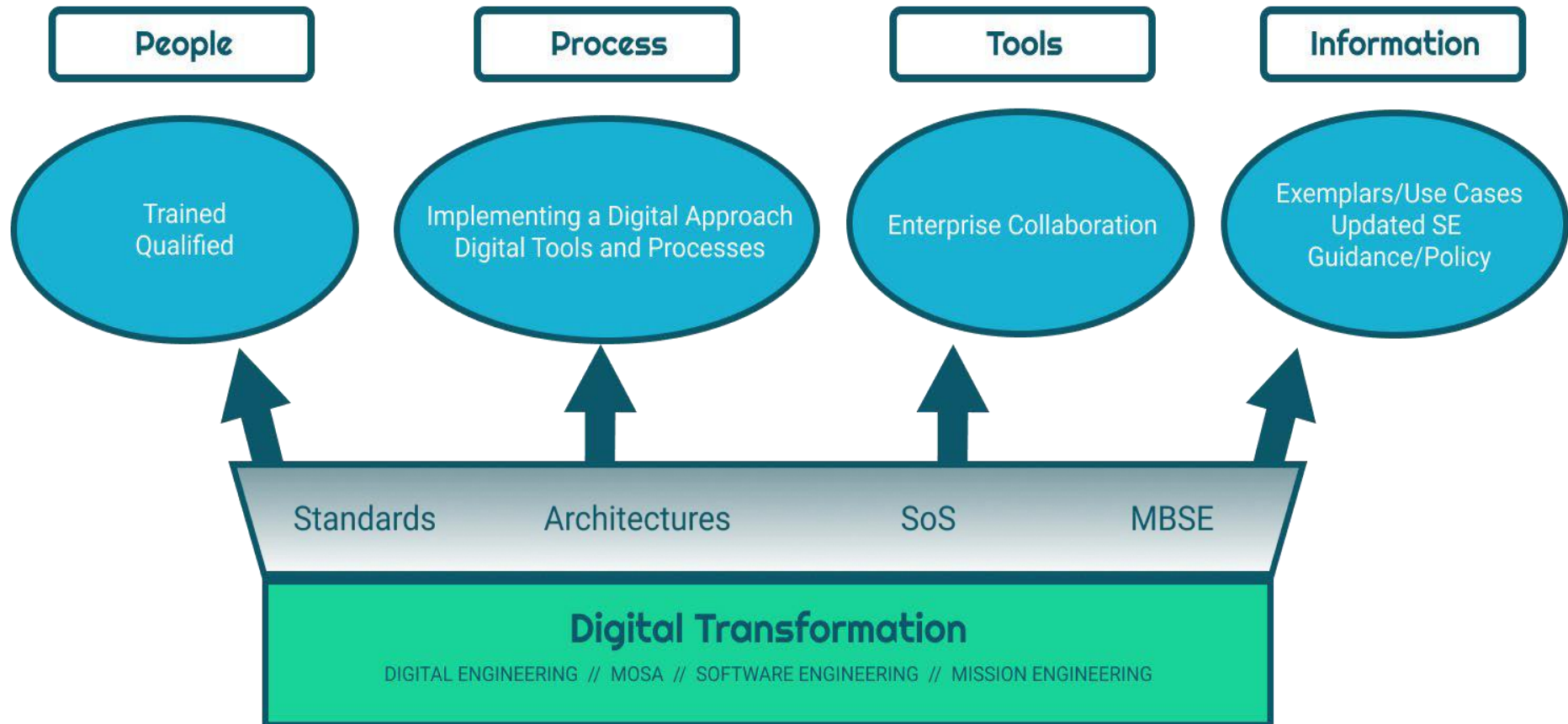
# Interfaces, Standards and Conformance Testing (10 U.S.C. §2446a,b,c (P.L.114-328))

- **System and component interfaces, along with supporting standards will be identified, developed, and sustained**
  - Enable efficient logistics and maintenance strategies; allowing interfacing components to evolve independently from the internal elements of a system
    - Development and sustainment of system interfaces will be coordinated and maintained through rigorous system configuration, configuration management and design disclosure
      - Other major systems interfaces will be maintained across the Services and DoD as necessary
    - Services will identify and select standards pertinent to their unique systems; where gaps exist, standards will be developed and sustained as necessary
      - Standards conformance testing to be conducted ensure consistent implementation
      - Defense Standardization Program (DSP) activities will be used and queried for help



# SE Modernization and Digital Transformation

## SEM Mod People Process Tools Info





# SE Modernization Body of Knowledge



## VISION

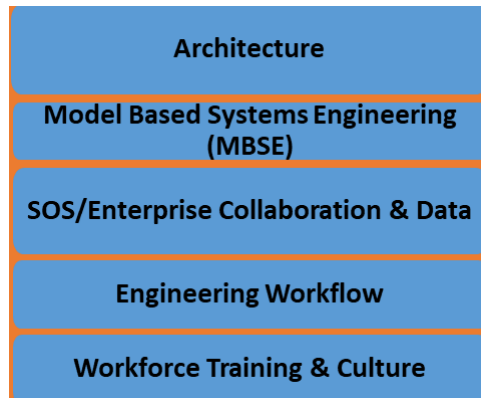
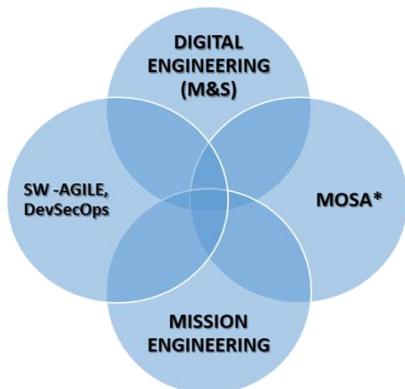
**Synergistically Integrated Content Across Focus Areas**

## STRATEGY

**Align To Metadata Associated With Cross Cutting Enablers**

## STATUS

**PROTOTYPE DEMO - 2/17/2022  
Cloud Based, Distro A Content**



**FUTURE STATE – EPS Integrated BoK  
Ongoing Collaboration:  
Infrastructure – Schema - Funding**



# Planned FY22/23 SE Modernization Workshops

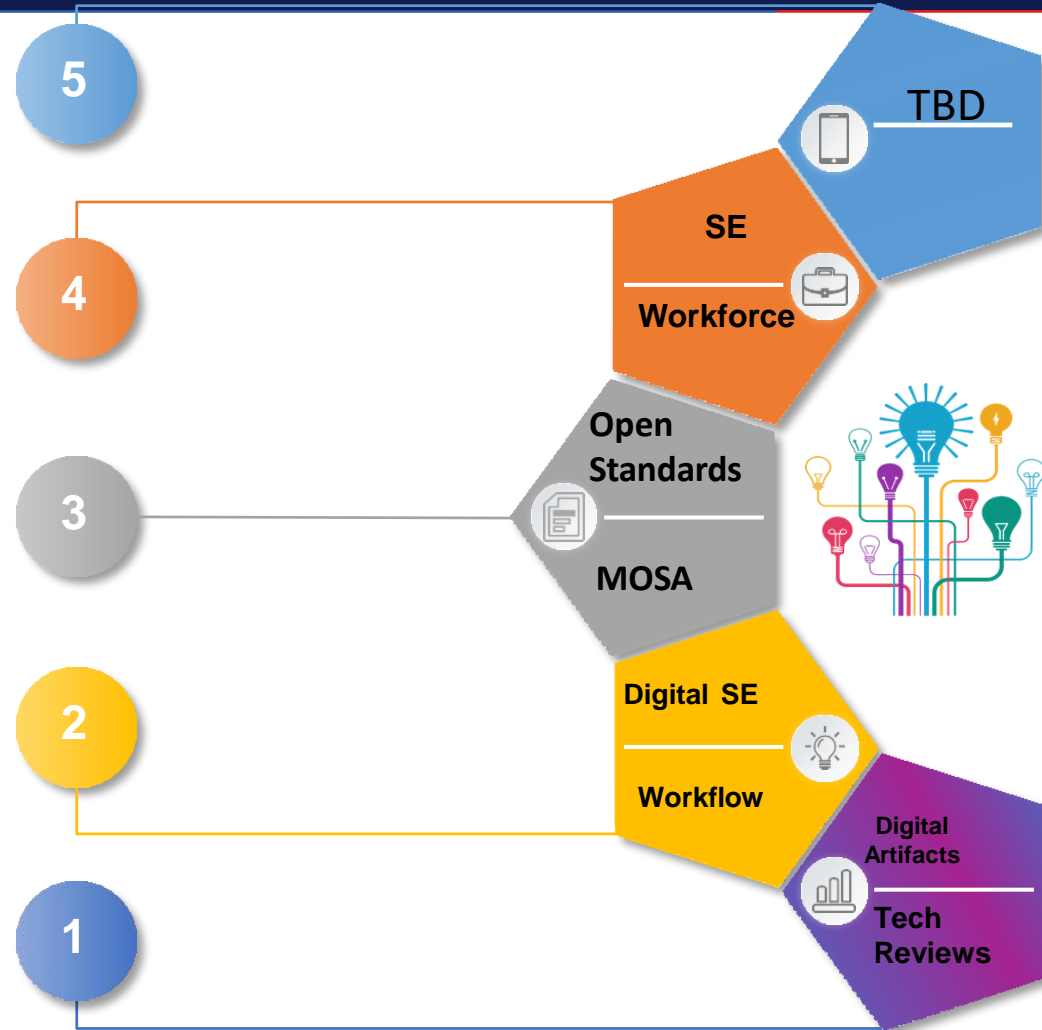
Specialty – **Focused Topics:** Digital T&E – R&M – Mission Engineering – Contracting for Digital Artifacts – Use of Reference Architecture

**SE Boot Camp** on Modernized SE Practices – Agile SE.

Implementing **MOSA & Open Standards** in a Digital Environment

**Engineering Workflow** in a Digital Environment

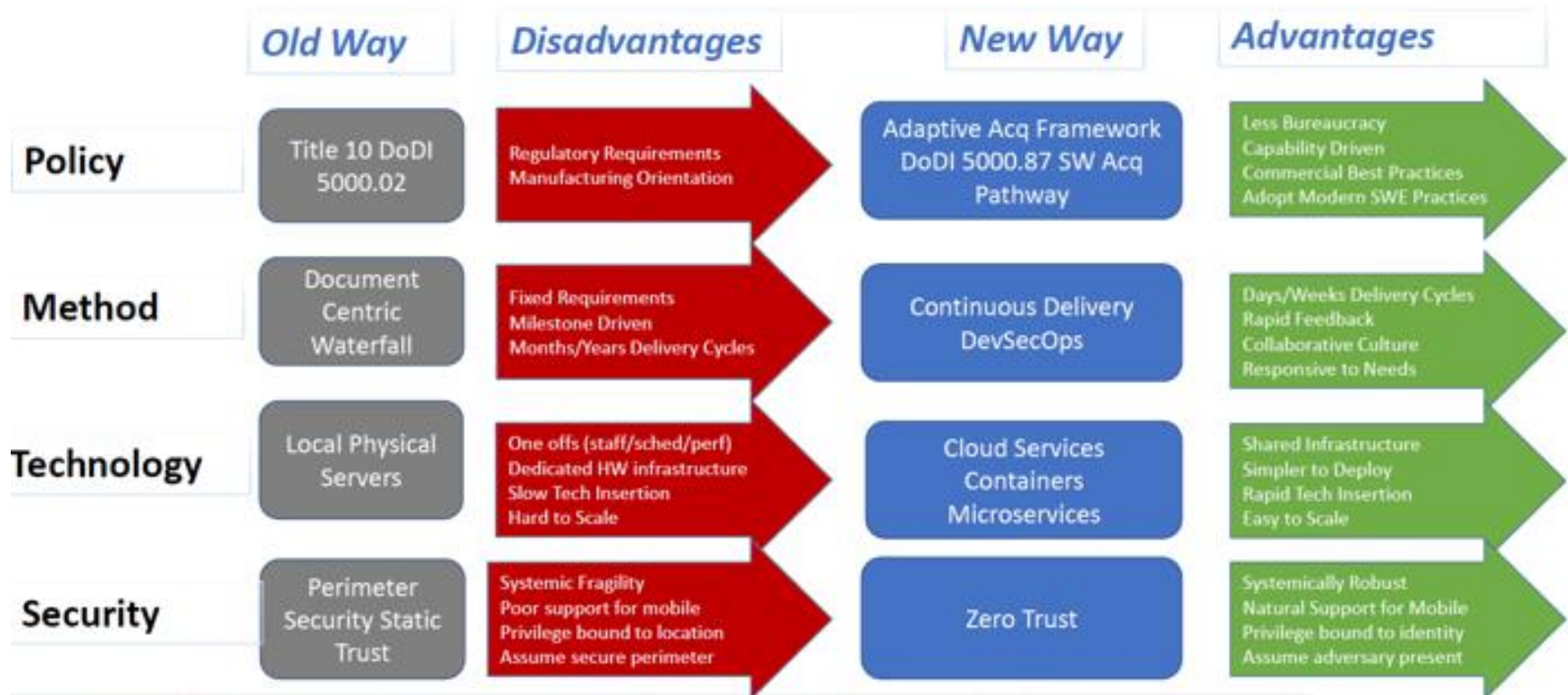
**Technical Reviews & Digital SE Artifacts** in a Digital Environment







# The Future of Acquisition





# Contact

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