

RT-182: Enterprise Systems-of-Systems Model for Digital Thread Enabled Acquisition

Sponsor: DASD(SE)

By

Dr. Chris Paredis and Tom McDermott
9th Annual SERC Sponsor Research Review
November 8, 2017
FHI 360 CONFERENCE CENTER
1825 Connecticut Avenue NW, 8th Floor
Washington, DC 20009

www.sercuarc.org

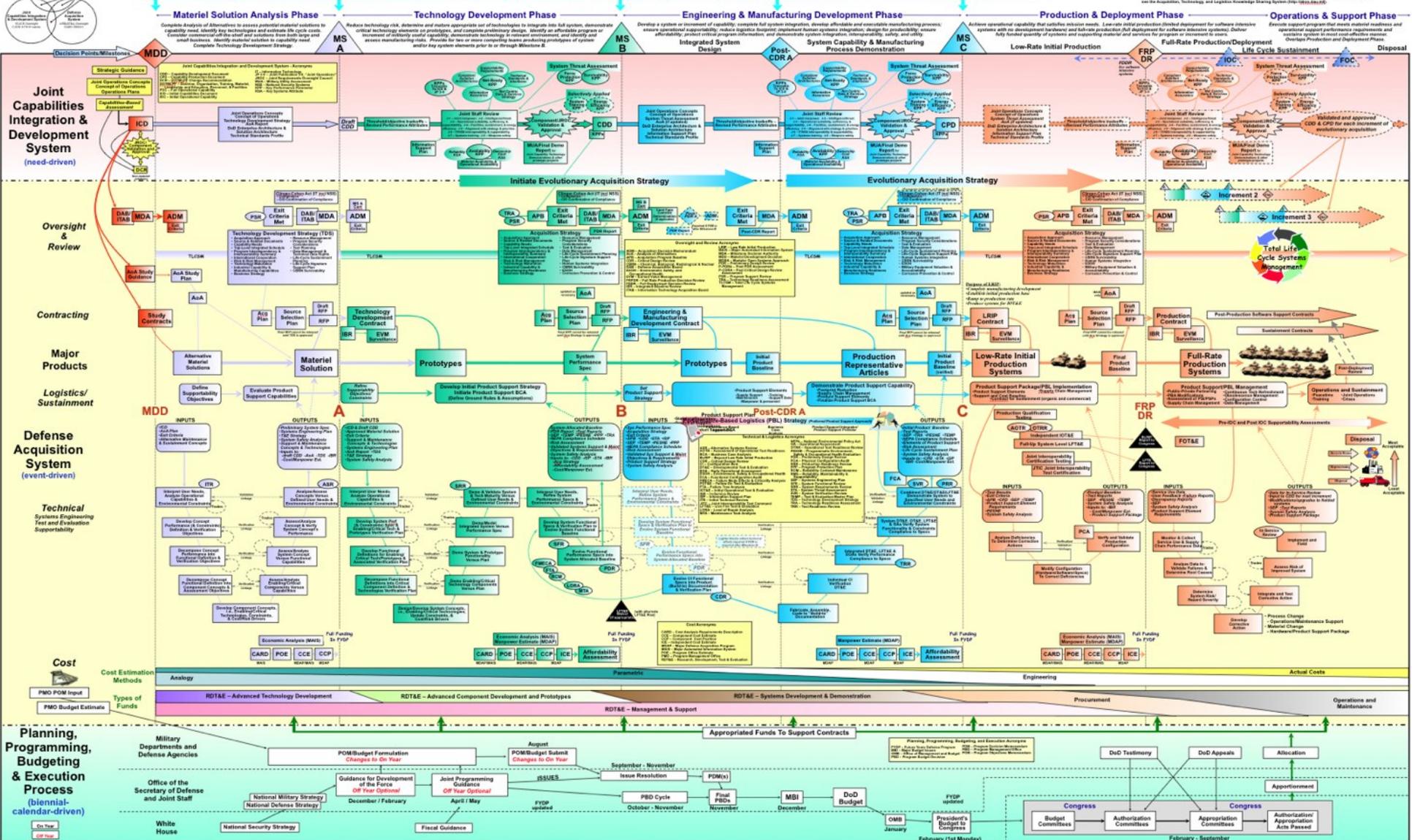
- Objective
 - Develop an enterprise transformation model that can be used to provide insight into Digital Engineering and its impact on defense acquisition
- Project team
 - Chris Paredis, Georgia Tech (PI)
 - Tom McDermott, Georgia Tech (co-PI)
 - Paul Collopy, University of Alabama, Huntsville (co-PI)
 - Molly Nadolski, Georgia Tech (faculty researcher)
- Timeline
 - July 14, 2017 through July 13, 2018
 - Subcontracts finalized at the end of August

Defense Acquisition Lifecycle

Version 5.34 1 June 2009

Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System

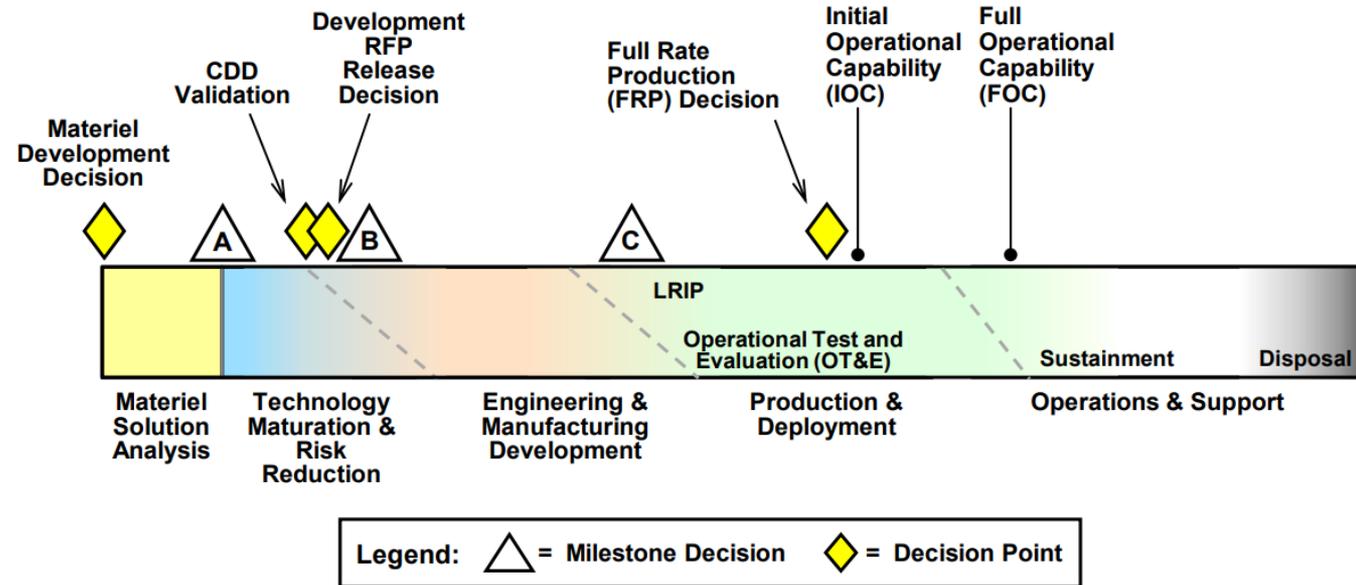
Following the Materiel Development Decision, the Milestone Decision Authority may authorize entry into the acquisition process at any point, consistent with phase-specific entrance criteria and statutory requirements

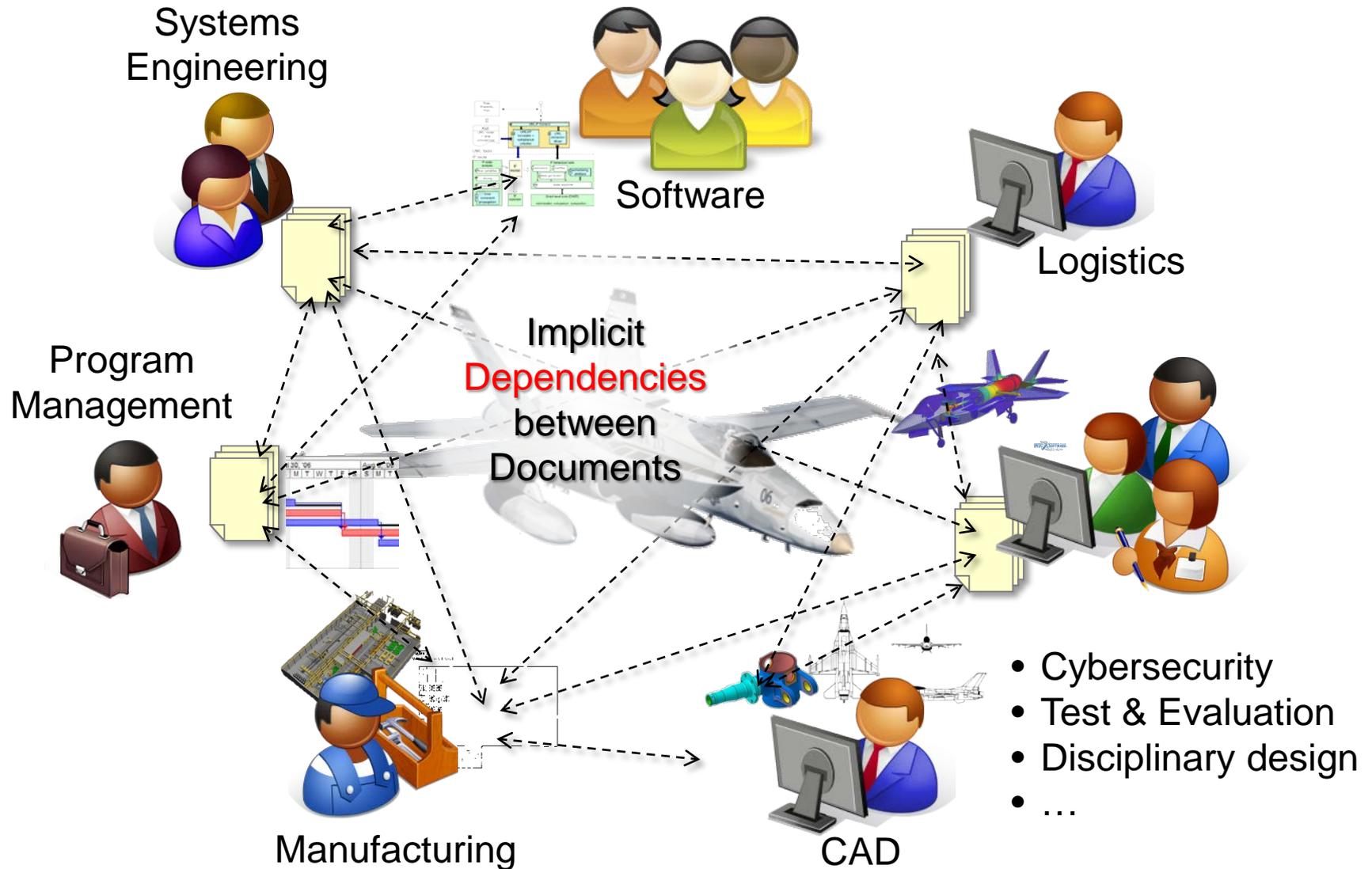


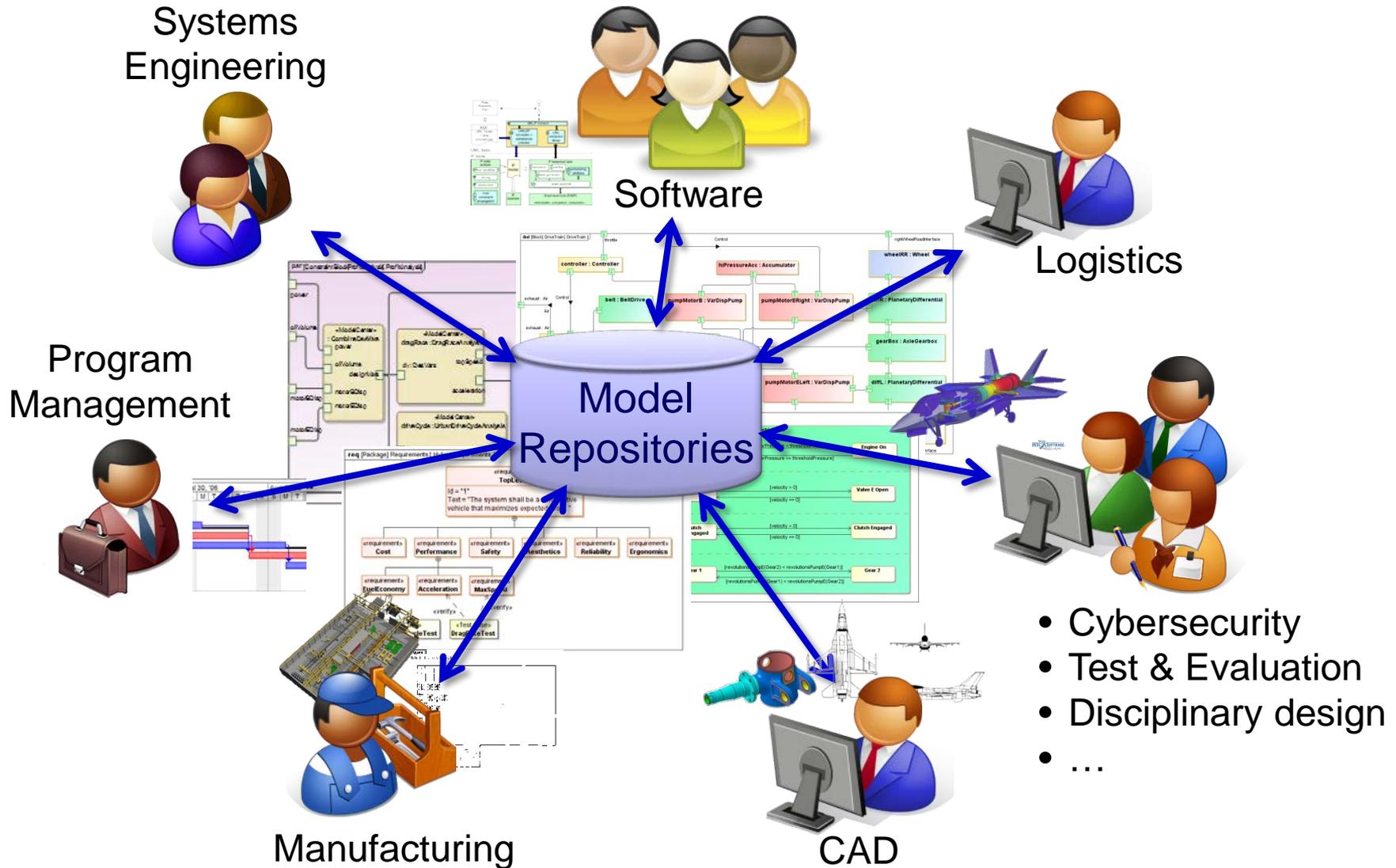
For a complete list of the staff and contact to develop this... Read more... to learn the rest of the story... visit our website...

Current DoD Acquisition System

- Follows mostly linear process through milestones and phases
- Stove-piped infrastructure
- Communication is supported by static disconnected documents
- Some discipline-specific models but not integrated across disciplines
- Process lacks agility and resilience — not suited for fast-paced technology innovation







- Cybersecurity
- Test & Evaluation
- Disciplinary design
- ...

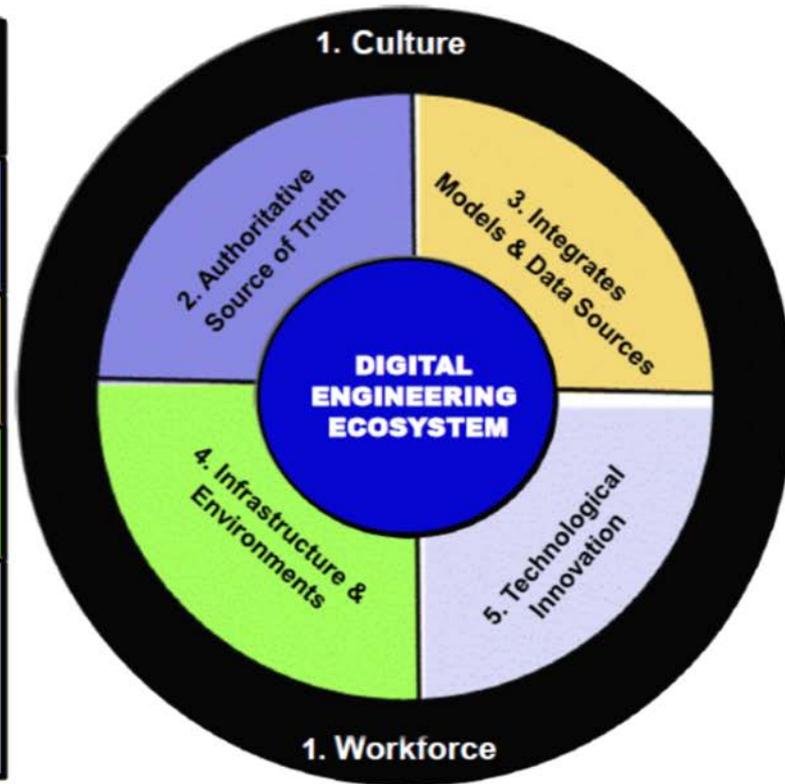
- *Digital Model-based Engineering (DMbE) is the use of digital **artifacts**, digital **environments**, and digital **tools** in the performance of engineering functions*
- *DMbE is intended to enable practitioners to engineer capabilities using digital practices and artifacts in a collaborative environment, creating a **digitally integrated approach with a federated single source of truth***
- *DMbE is intended to allow an organization to progress from documentation-based engineering methods to digital methods that may provide **greater flexibility, agility, and efficiency***



Digital Engineering Strategic Goals



- 1 Develop and maintain a *culture and workforce* that adopts and supports Digital Engineering across the lifecycle
- 2 Formalize development and use of models for providing an enduring *authoritative source of truth*
- 3 Foster the *integration of models and data sources* across functional disciplines to inform enterprise and program decision making
- 4 Establish supporting *infrastructure & environments* to perform engineering activities, collaborate, & communicate across stakeholders
- 5 Leverage advanced tools, computing power, and advanced capabilities to improve system capabilities, automate workflow processes (as applicable) and generate digital artifacts and deliverables using models



- We expect DE will affect
 - Engineering processes
 - Information sharing between stakeholders
 - The structure of organizations
 - The entire business eco-system: competition, risk attitudes, business models
- Before we make changes and define new policies...
let's aim to understand the consequences of the policies and how they may transform the acquisition eco-system
- Approach:
Create an enterprise systems-of-systems model
for DE Enabled Acquisition

- What changes are likely to emerge from the transition to digital engineering processes, methods, and tools?
- What are the enablers and barriers to such innovation in the DoD acquisition enterprise?
- What stakeholders will be affected and how will they likely embrace or oppose change?
- How might stakeholders be incentivized to embrace innovation and how will this be measured?
- What are the leading and long-term indicators of change?
- How might the value of such changes be predicted and measured?

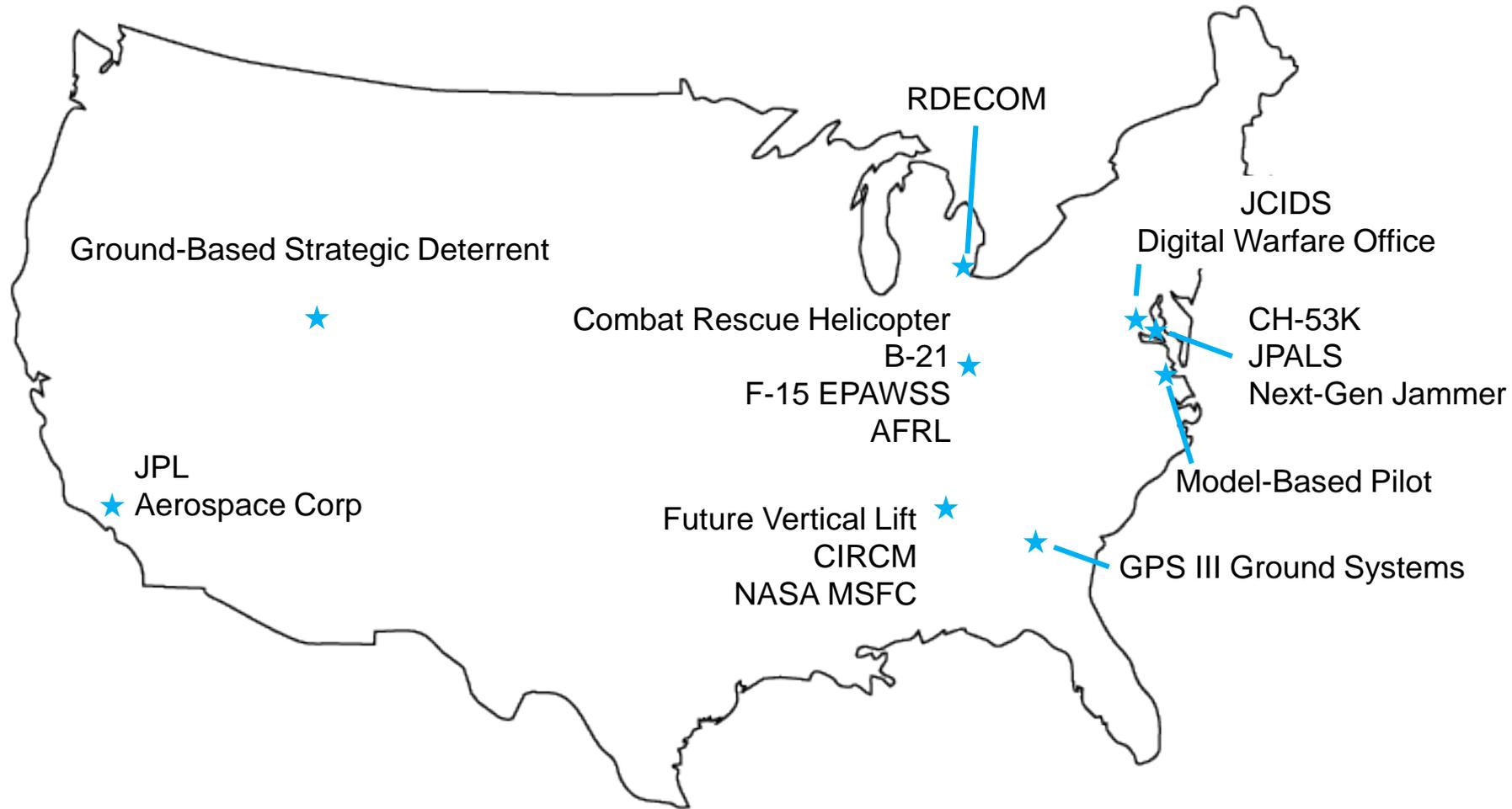
- Builds on enterprise systems-of-systems methodology
- Semi-structured interviews with key stakeholders
- Iteratively develop Systemigram model
 - Identifies key actors, activities, enablers and barriers to change that drive desired system outcomes
 - From interviews, develop a series of narratives
 - Get additional feedback from stakeholders during workshop

- Generate and Analyze scenarios with Systemigram “shows”
 - Identify opportunities and challenges (e.g., intellectual property, training, infrastructure,...)
 - Identify and analyze potential modifications/improvements to DE and corresponding processes
 - Identify short-term and long-term value propositions for each of the key stakeholders
 - Identify possible incentives to accelerate adoption

- Structure
 - 1 – 1½ hours
 - Semi-structured — prepared list of questions but with room for adaptation
- Focus
 - Change and transformation at multiple levels: individuals, processes, institutions and domain
- Changing horizons — from current state to envisioned future state
- Technology — evolution, innovation, adoption, impact
- Workforce — changing needs
- Domain — acquisition initiatives and policies
- Community — collaboration, data sharing and knowledge transfer
- Innovation Stakeholders, Enablers and Barriers

- Tell us about your knowledge of systems engineering, model-based systems engineering (MBSE), and the defense department's "Digital Engineering" initiative, and how these are being used today.
- Will "Digital Engineering" change the work your group does? In what ways?
- What activities or practices cannot be sustained in the current defense acquisition process as we know it today?
- What will systems engineering and related defense acquisition activities look like 10-15 years from now?
- How have new technologies changed systems engineering support to acquisitions over the last several years?

- Identify potential interviewees according to the following criteria
 - People who have direct involvement and first-hand experience in the identified acquisition activities (mostly not executives)
 - People involved on both sides (gov't & contractors) of the same program
 - People with expertise in MBSE (pilot leads, leading edge practitioners)
 - People involve in programs of different size and lifecycle phase.
- Organize the interviews in geographic clusters



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- Status
 - Interview structure developed
 - Interviewees identified
 - Ready to start interviewing...
- Stay tuned — more insights and conclusions when we have collected and analyzed the data