AFC Digital Engineering Transformation

ARMY FUTURES COMMAND

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AFC Digital Engineering Transformation

- **Objective:** Establish a collaborative, interoperable digital environment that provides enhanced speed and availability to authoritative data and digital artifacts throughout the system lifecycle to effectively support program milestones, Systems of Systems (SoS) integration, Modeling and Simulation (M&S), test events, exercises, experimentations, and drive senior leadership decision making.

- Strategic (*Drive change across the DoD*) : (1) Supports and aligns to the DoD Digital Engineering Strategy and allows for better synchronization of technology across the DoD; (2) Supports mission thread and capability analysis for Joint operations and exercises

- Operational (*Drive change in the Army*): (2) Establishes the Army Digital Thread and traceable digital artifacts to support system development, integration, analysis, and sustainment across the system development life cycle, (2) Expedites seamless controlled transfer of authoritative technical data, software, information and knowledge between external stakeholders and system owners (e.g. ASA(ALT), AMC, etc.) for continued system development and integration efforts expanding beyond Milestone B

- Tactical (*Drive Change in AFC*): (1) Provides a modernized and adaptable systems engineering environment, changes within a system and system of systems (SoS) can be rapidly evaluated for benefits of cost, schedule, performance and technical risk reduction throughout a system's life cycle; (2) Enhanced rigor and speed of information availability and reuse, analysis, and development of systems and capabilities to Milestone B, (3) Provides verification and validation for interfaces between systems and SOS integration prior to experimentation and exercise events allowing for enhanced learning

DoD Digital Engineering Strategy & AFC

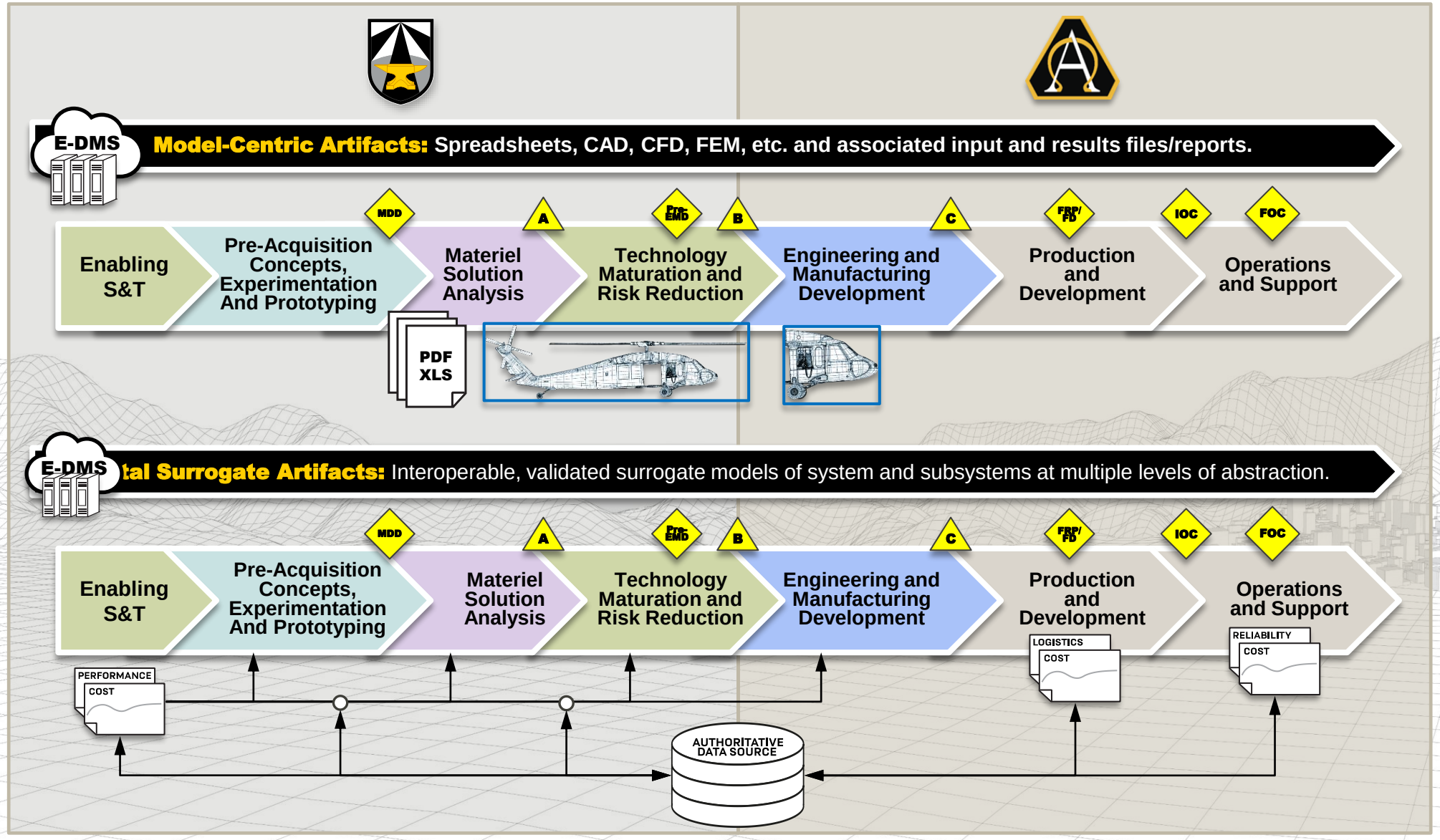
June 2018: The Deputy Assistant Secretary of Defense for Systems Engineering implemented a Digital Engineering Strategy with five goals.

1	**Formalize Development Integration and Use of Models** | There is current collaboration across the CFTs with the RSI Division for the implementation and increased use of MagicDraw for MBSE artifacts. This approach requires the Teamwork Cloud environment for MagicDraw to achieve maximal effectiveness. This is not intended to be prescriptive
2	**Provide an Authoritative Source of Truth** | The ArCADIE repository is described as the architectural source of truth for the Army. However, improved linkage between the system models and the AFC managed AME Baseline model is needed.
3	**Incorporate Technological Innovation** | AFC will increase digital engineering capabilities to enhance decision-making, through automation by the integration of digital engineering tools and data already used within AFC.
4	**Establish Infrastructure and Environments** | Deploying the AME cloud environment will create the necessary infrastructure for data storage and collaboration across the AME. Full understanding and usage of the capabilities will be the responsibility of AFC HQ to ensure all parts of the AME are collaborating and the cloud environment is properly informed.
5	**Transform Culture and Workforce** | This strategy will alleviate the issues of complex culture change using a collaborative approach to the implementation of digital engineering. Create a DE Transformation whitepaper from the RSI Division to serve as the communication of the digital engineering vision and strategy for AFC.

Digital Engineering and the Acquisition Lifecycle

Needs to span the lifecycle from concept to disposal.

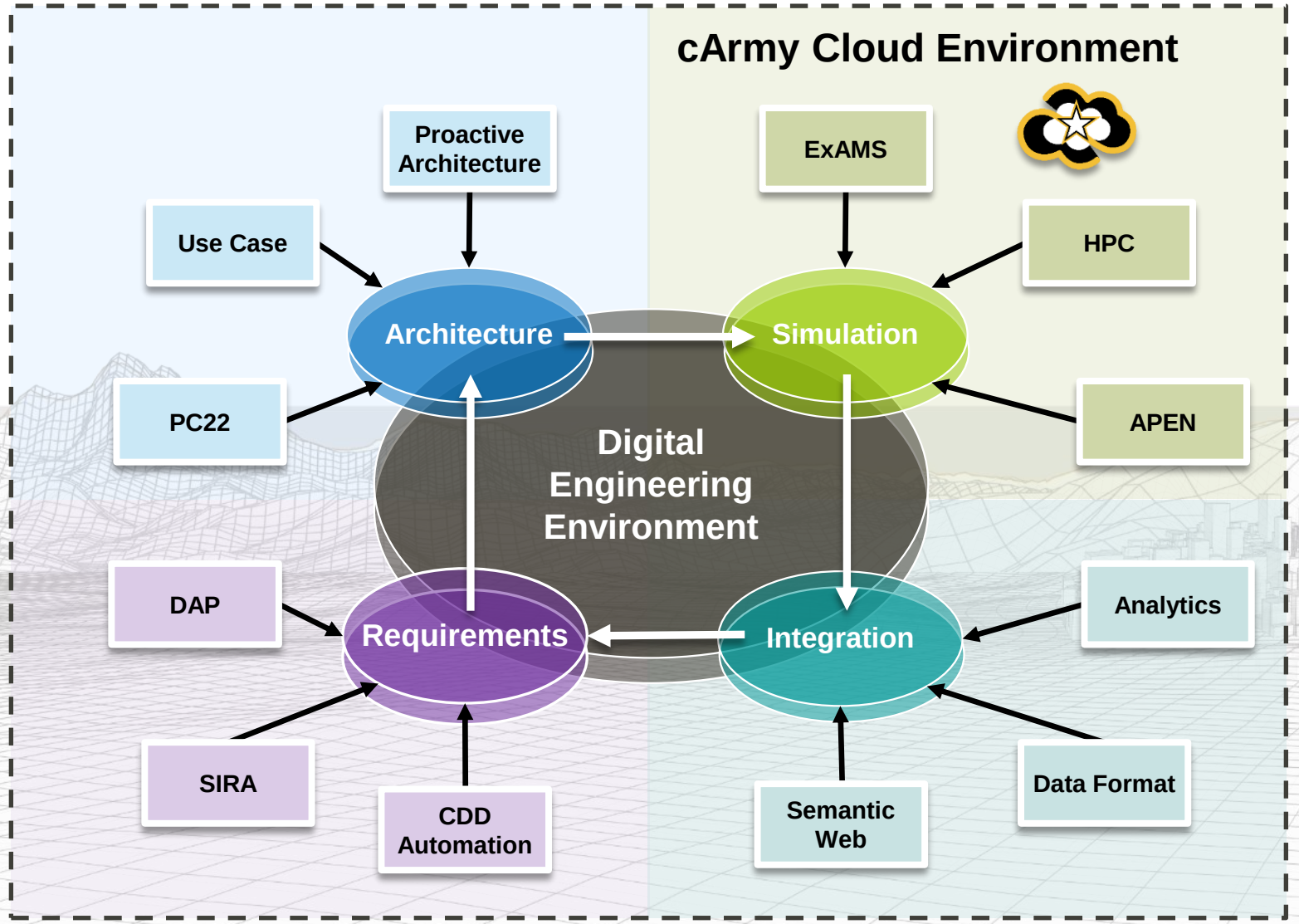
AFC is focused on defining the digital thread from Pre-Milestone A to Milestone B and ensuring a smooth transition to ASA(ALT)



Digital Ecosystem

System Engineering Transformation utilizing DE

- Utilize DE to drive, mature and support evolving requirements
- Drive better interoperability and System of System integration
- Model operational capabilities with authoritative data to drive better decision making
- Full digital traceability of requirements, design, test, and information; available from one source of truth
- Model Operational capabilities with authoritative data to drive better decision making
- Risks are identified and risk mitigations are executed via DE enterprise processes
- Reduced deliverable defects, deliverables acceptance rate



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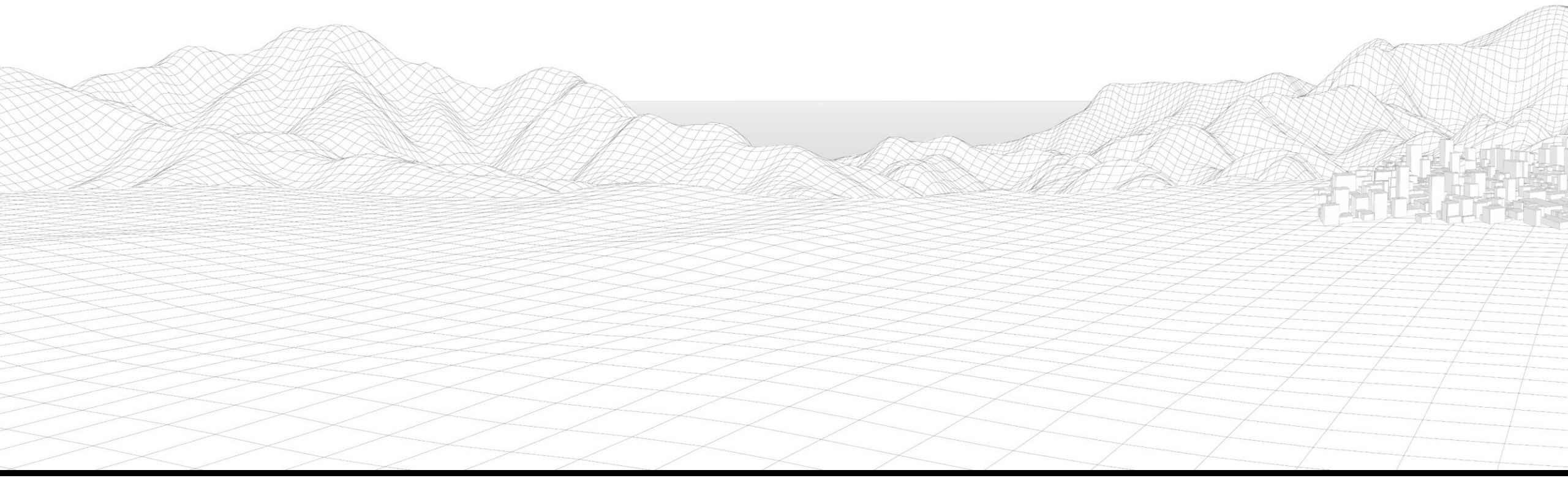
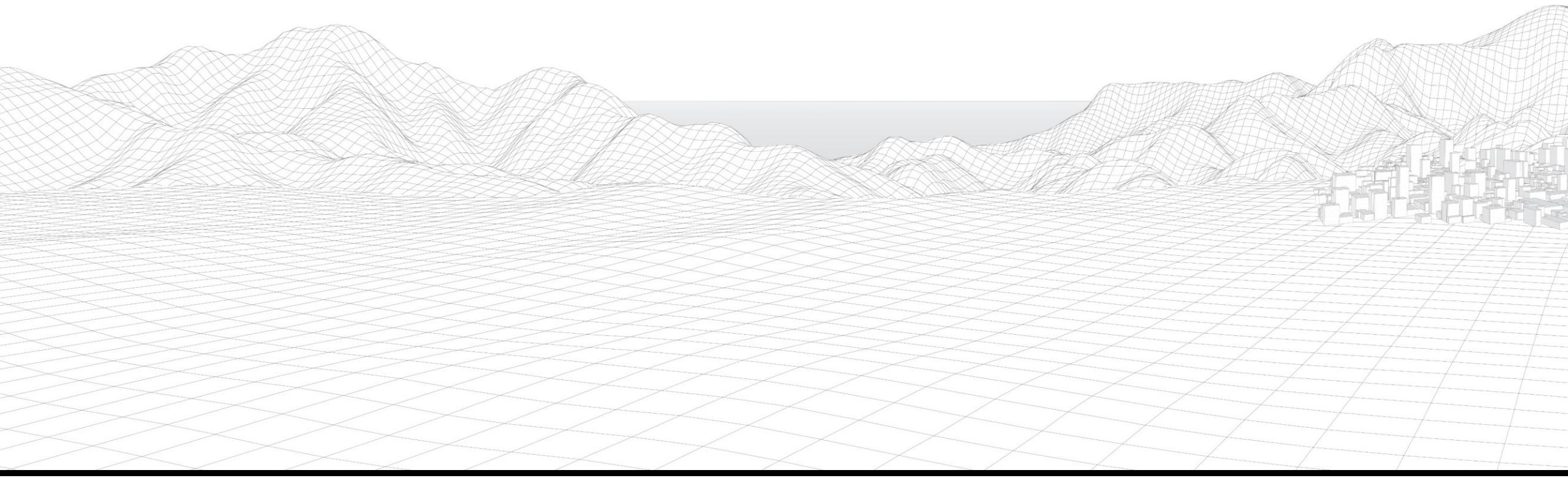
Questions?



Back-up



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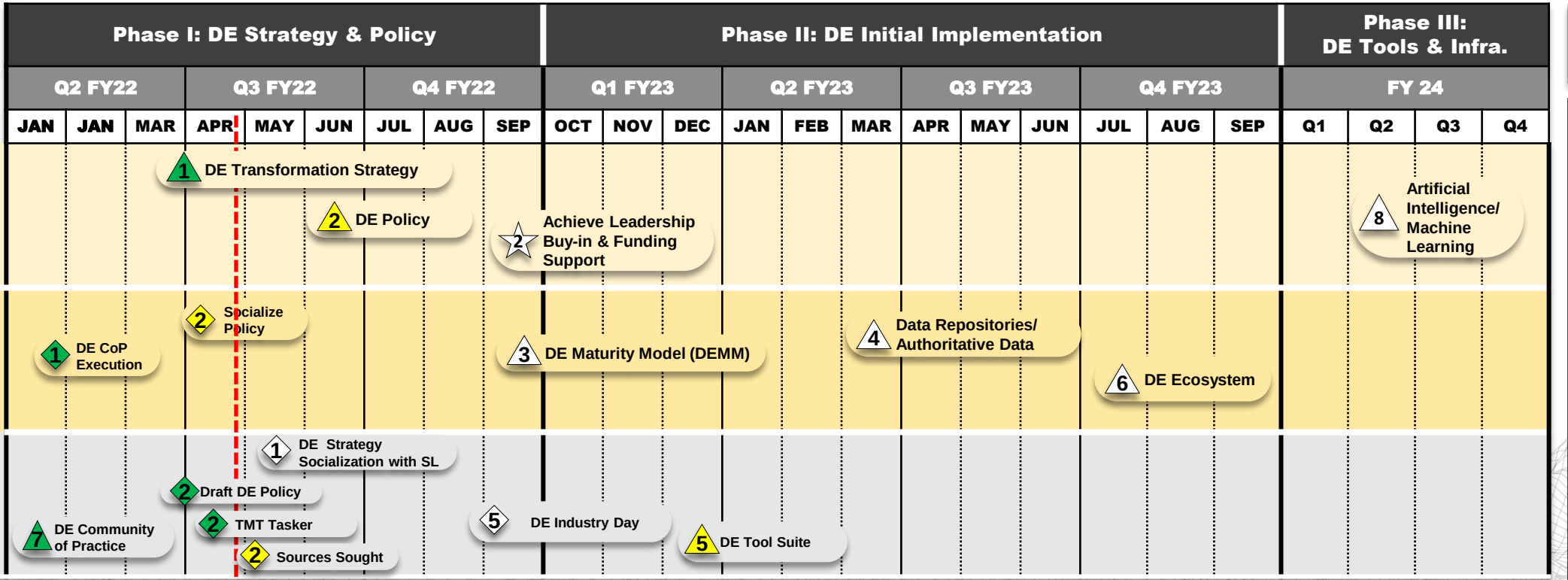
LOE 2, OBJ D: Transform Digital Engineering



Desired Future State

S: Supports JADC2 mission thread and capability analysis
O: Establishes the Army Digital Thread and traceable digital artifacts to support system development & integration
T: (1) Provides a modernized and adaptable systems engineering environment, (2) Systems and system of systems (SoS) can be rapidly evaluated for benefits of cost, schedule, performance and technical risk reduction throughout a system's life cycle; (3) Provides enhanced rigor and speed of information availability and reuse, analysis, and development of systems and capabilities

Assessment

Phase I: DE Strategy and Policy

Create a community of practice within the organization to provide DE guidance, expertise, and other resources

Indicators:
- DE Strategy and Policy are being executed
- Define and implement a systematic change approach to implement DE
- Messaging, awareness of DE, participation in reviews, performance management incentives, succession planning

Phase II: DE Initial Implementation

Demonstrate commitment and general support for DE implementation

Indicators:
- Better communication/info sharing
- Collaboration
- Leadership support
- Change management processes
- Availability of tools, investment in tools, experience with tools, stability of tools
- Appropriately trained & experienced workforce, customer
- better access to information

Phase III: DE Tools and Infrastructure

Develop a workforce having the knowledge and competencies to support DE adoption.

Indicators:
- Provide a foundation to integrate models.
- Risks are identified and risk mitigations are executed via DE enterprise processes.
- Existing data repositories are linked and interoperable
- Full digital traceability of requirements, design, test, and information; available from one source of truth
- Reduced deliverable defects, deliverables acceptance rate

End State

Design outcomes show improvement over similar programs, the design process is more effective compared to similar programs

Indicators:
- Integrated data repositories, with access and availability to authoritative data
- Readily accessible system data to feed M&S capabilities to support key decision making.
- Automated versus manual activities
- cArmy unclassified and classified domains are fully operable

Legend:

- ☆ Decision Point
- 1 Primary Task
- 1 Supporting Task
- Task Complete
- Task Incomplete

Enterprise DE Tool Suite Requirements

How an Enterprise Tool Suite and License will reduce overall costs to the command.

- **Reduce** the costs of licenses and sustainment
- **Maintain** interoperability of tools
- **Standardize** product formats for reuse and sharing
- **Standardize** business practices

Enterprise DE Tool Suite Requirements

- **Architecture** (Cameo / MagicDraw)
- **Requirements** (may need light version of DOORS NextGen for occasional pulls from DEVCOM)
- **M&S** (licenses to see/ingest products developed; verify integration requirements met and feed SoS analysis / ExAMS)
- **PLM** (CM/traceability and integration of potential ePDM stovepipes, Aras Innovator)
- **PDM (**ePDM**)**
- **Analysis/Visualization** (R, Python, MATLAB, Spark, SAS, Tableau, PowerBI)
- **Risk/Schedule** (Sword ARM, Project Cloud, Resolver)
- **DDSD Support** (database mining/integration scripts)