



## Office of the Assistant Secretary of the Army

### Acquisition, Logistics and Technology



### **Data – the Key to Modernization**

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11 OCT 22



# HQDA 009-20 EXORD (FRAGO 5) FY 22-23 Plan

## Step 1. Echelons Above Brigade (EAB) Operational Framework

- **Forces Command (FORSCOM) and G-3/5/7 identify the units and exercises**
- **Strategic focus is:**
  - Theater
  - Aligned Corps – Multi-Domain Task Force (MDTF)
  - Division

## Step 2. Finalize Prioritization of Needs

- **Get digital operations (i.e., data, cloud, Unified Network, and artificial intelligence (AI)) needs statements (from field units identified in Step 1)**
  - Mission statement of needs (requirements) to enable experiments that identify take-aways (capabilities to be sustained past the experiments and leave residual value)
- **Identify the unit Point of Contact (POC) who will be available to further define the requirement**

## Step 3. Finalize Prioritization of Solutions

- **SE teams identify solutions to address the capability gaps identified in Step 2**
  - Work with the units to further refine the requirements
  - Determine the nature of solution, resourcing, and timeline to achieve the solution
  - Bring in expertise as needed to assist (e.g., Cross-Functional Team skills)
  - Provide the plan to achieve the need

## Step 4. Program Objective Memorandum 25 (POM25) Implications

- **Execution and Monitoring**
  - Provide the solution to the field/units
  - Monitor progress and capture lessons learned
  - Army Data Panel (ADP) to review implementations of the digital operations needs statements: resourcing, integration, overcoming friction points, proposed solutions, and policy issues
  - ADP to provide foundation for follow-on work to include planning for the next POM cycle





# HQDA 009-20 EXORD (FRAGO 4) Phase II Strategic Efforts (SE)

## STRATEGIC EFFORTS (SE):

- SE1. (G3) ACTIVITIES FOR FUTURE DECISION MAKING.** IDENTIFY PRIORITY OPERATIONAL ACTIVITIES AND EXPERIMENTS IN SUPPORT OF WAYPOINT FORCE DEVELOPMENT THAT CENTERS ON FUTURE FORCE DATA-CENTRIC DECISION MAKING.
- SE2. (CIO-CDAO) DATA MANAGEMENT.** PROVIDE DATA MANAGEMENT, AND DATA SERVICES TO SUPPORT RAPID DEVELOPMENT OF DATA DECISION CAPABILITY, TO INCLUDE APPOINTMENT OF DATA STEWARDS AND IDENTIFICATION OF AUTHORITATIVE DATA.
- SE3. (ASA(ALT) / AFC-FCC) ARCHITECTURE.** ARCHITECTURE REQUIRED FOR SUPPORTING CRITICAL MISSIONS SUCH AS OPS INTEL INTEGRATION.
- SE4. (G-6) UNIFIED NETWORK.** PROVIDES A UNIFIED NETWORK IN SUPPORT OF SE1.
- SE5. (MCCOE) TALENT.** ARMY BUILDS AND EMPLOYS THE RIGHT TALENT.
- SE6. (ASA(ALT) and AFC) SCALABLE DATA-DRIVEN DECISION SUPPORT.** DEFINE THE DECISION FRAMEWORKS, TECHNOLOGICAL REQUIREMENTS, AND GOVERNANCE NEEDED TO ENABLE SELF-SERVICE, DATA-DRIVEN DECISION SUPPORT AT ECHELON IN A SECURE, SCALABLE, REPEATABLE MANNER.
- SE7. (CIO-ECMA) CLOUD AT ECHELON.** PROVIDE CLOUD AND CLOUD SERVICES AT ECHELON.
- SE8. (CIO-CDAO/CIO-G2) DATA PROTECT.** DEVELOP DATA PROTECT AND DATA ACCESS POLICIES.

### Note.

- ❖ FRAGO 4 TO HQDA EXORD 009-20 ARMY DATA PLAN IMPLEMENTATION IN SUPPORT OF CLOUD MIGRATION
- ❖ ADP SE OPR Working-Group fostering relationships across legacy silos and working with the field directly to engage in experimentation to inform policy creation
- ❖ FRAGO 5 will operationalize activities for future decision making



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# The Army's Current Data Environment is Complex



- Current system/network centric approach makes data sharing complex
- Excessive duplication and retention are reducing data quality and authority
- Data is trapped by proprietary software and multiple function specific message protocols
- Data resides on separated networks at different classification levels
- Different organizations need common data to perform different functions
- Common Enterprise Services are not in place to share data efficiently and securely
- Employing multiple Data Fabric solutions adds complexity



**Complexity Impedes Decision-Dominance**



# ASA (ALT) is defining a Unified Data Mesh Reference Architecture



- Reference architecture will govern acquisition of data centric capabilities
- Defines hybrid data mesh and fabric for enterprise and tactical environments
- Flattens Army's data architecture for effective and efficient data driven decisions – Increased Lethality
- Aligns with Army Data Plan and Decision Driven Data CONOPS
- Enables transport agnostic data exchanges supporting the full range of network at all echelons
- Improves data quality and authority through domain owned data products
- Defines enterprise mesh services for data discovery and self-service consumption
- Reduces replication and persistence of data
- Federates and decentralizes data and governance
- Secures data at rest and in motion
- Soldier needs and feedback drive data product content
- Reduces duplicative, transactional data sent and saved across Army echelons
- Reduces redundant system features & capabilities

***Using Data Mesh to simplify the complex for efficient and effective data driven decisions***





# Data Mesh Enables Data Centricity from Enterprise to the Tactical Edge



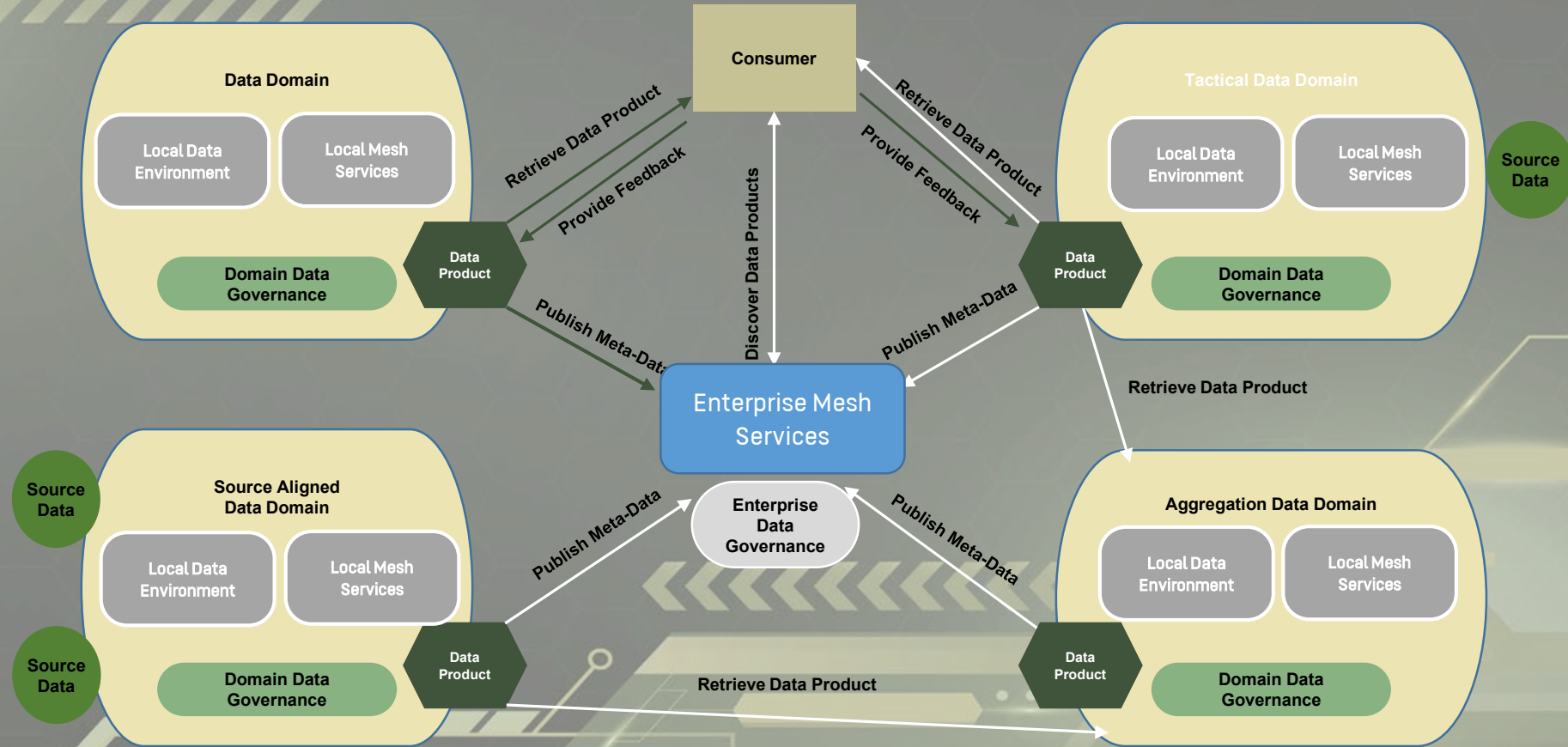
## Key Data Mesh Principles

*Data Ownership by domain*

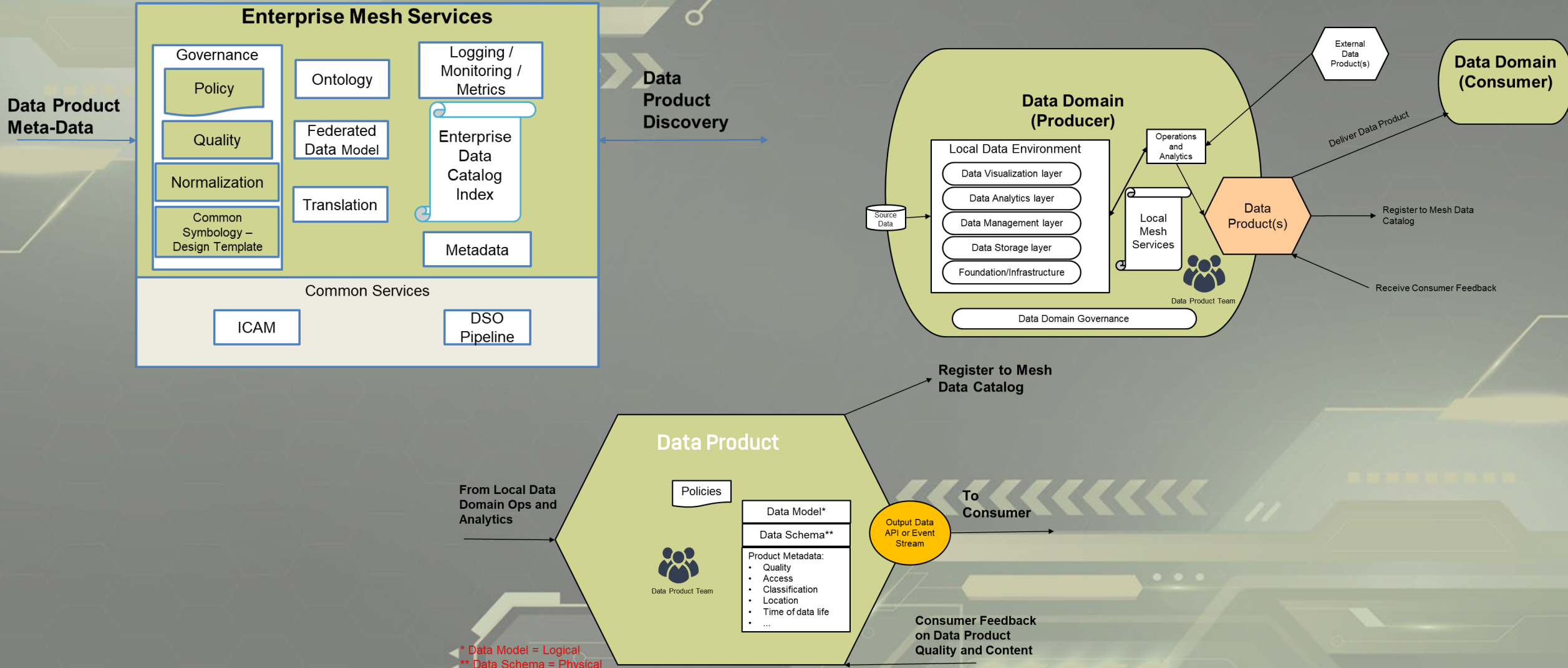
*Data as a Product*

*Data available everywhere, Self-Serve*

*Federated and Decentralized data Governances*



# Key Components of Data Mesh



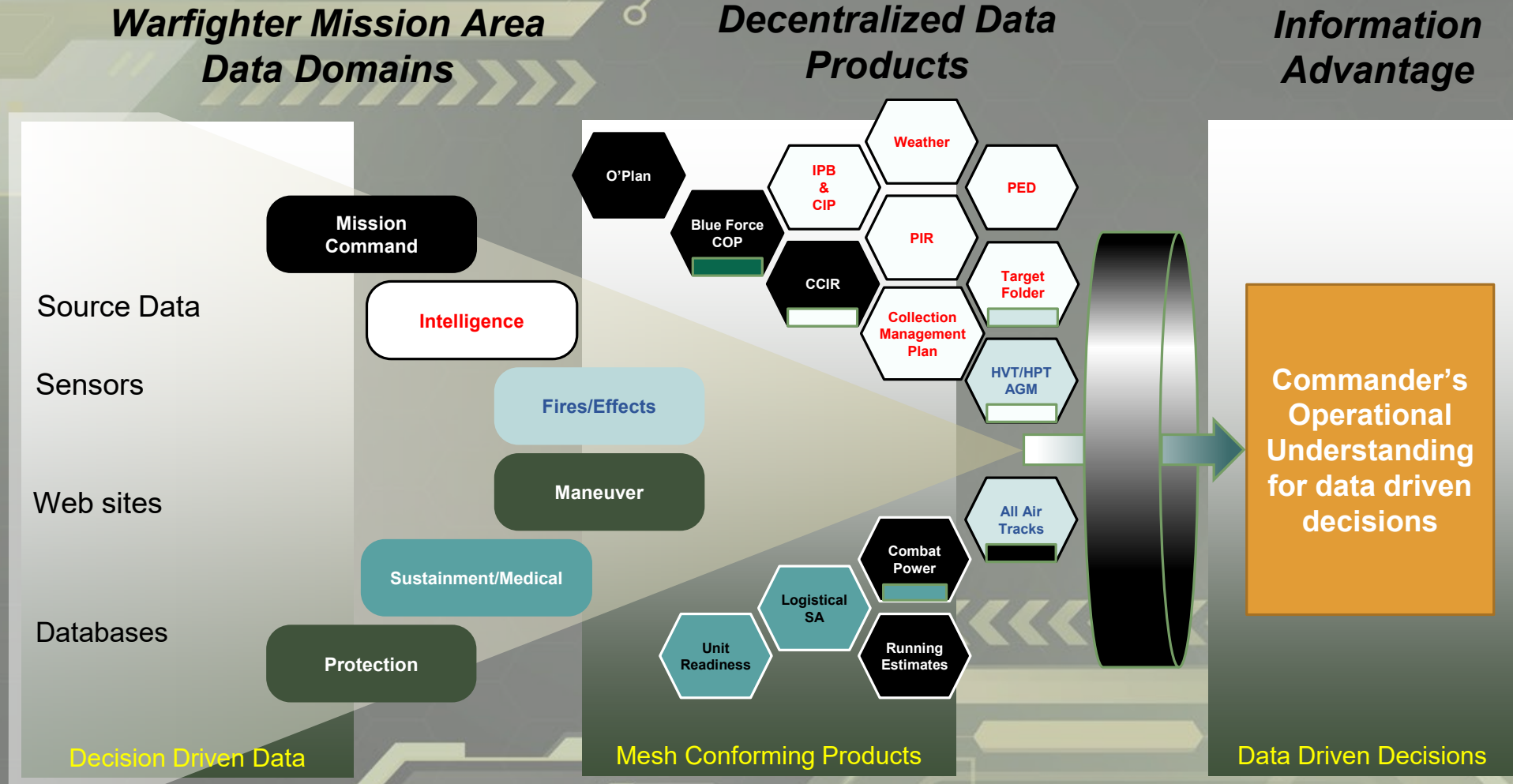
\* Data Model = Logical  
\*\* Data Schema = Physical

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# Data Domains Responsible for Producing Decentralized Data Products





# Unified Data Architecture Way Ahead - Theory to Action

- Iteratively elaborate the reference architecture
- Engage Army and industry stakeholders for feedback
- Assess current data centric programs for alignment and gaps to the reference architecture
- Establish reference implementations in conjunction with ADP experiments and exercises
- Align with Army and Joint data initiatives (i.e. MCCoE D3 CONOPS, JADC2, AFC Battle Labs)
- Implement Unified Data Architecture within ASA(ALT) PORs
- Provide Contract Language for conformance or compliance to ASA (ALT) Data Mesh Reference Architecture
- Data Mesh Reference Architecture will support implementation guidance & policy for the implementation of technology across critical Computing Environments





# Questions to Industry



- What barriers exist to conforming with the reference architecture?
- Does the RA provide sufficient detail to develop conforming systems?
- Is the Digital Engineering model format usable (MagicDraw UMF Model)?
- Is the Data Product description and metadata correct and what more is needed?
- What technologies / products currently exist that can produce and or consume conforming data products?



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# Objective State of the Future Network

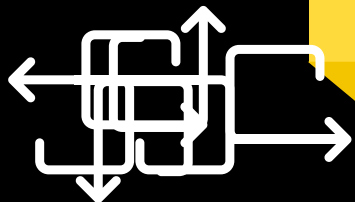


## Focus areas and key concepts driving network modernization within the signature modernization efforts



### Transport Agnostic Networking

The future network needs to be resilient and ubiquitous to the user, supporting high throughput, low latency, multi-path transport capabilities



### Data Centric Environment

Access to data at the point of need is a major priority for the operational force. Soldiers must be able to access data at the edge while sharing it with joint service and coalition partners. Data must be found, enriched, made available, and secured with common standards



### Security Architecture

Adapting our architecture encryption to keep pace with future technology, including zero trust and multi-level security approaches



### CEMA Dominance

Cyber resiliency across network systems to rapidly identify and defend against vulnerabilities, protect from adversary EW/ISR, and deliver network-enabled cyber and EW effects



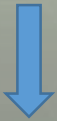
# Tactical Data Fabric Path Ahead



*PC22 provides an opportunity to experiment with improved tactical data fabric capabilities and inform JADC2 by adding scale, increasing integration, and focusing on cyberspace, intelligence, and logistics/sustainment capabilities.*

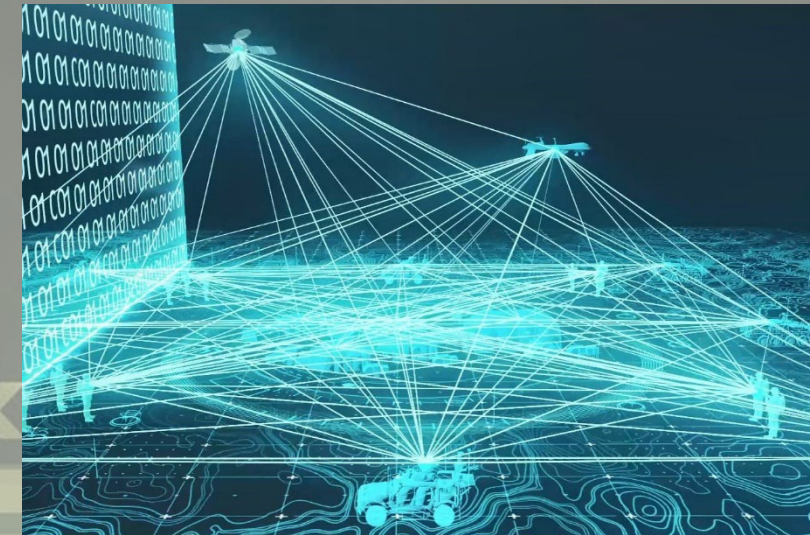
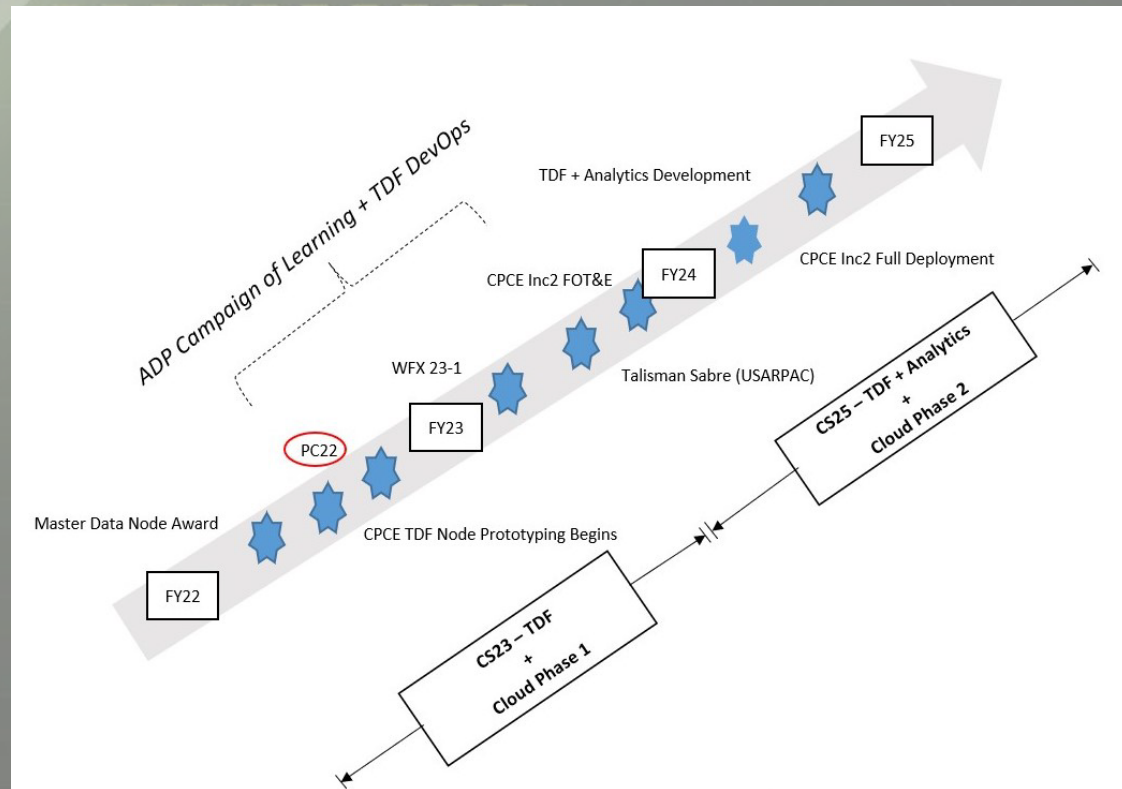
## 2021 capabilities

- Intel
- Fires
- Joint



## 2022 capabilities

- Intel
- Fires
- Joint
- Coalition
- Cyber
- Logistics/Sustainment
- Data discovery
- Data analytics



Network CFT funded Rainmaker/LEAP to converge capabilities and deliver working data fabric with LEAP (LTAC) as the base for the CS23 Command Post Computing Environment (CPCE) Tactical Data Fabric (TDF); technology transition agreement signed with PEO C3T





## MULTI-DOMAIN INTELLIGENCE

Army G-2 Vision: Deliver a Ready, Total Army Intelligence Team to Enable Multi-Domain Operations by 2028 and Dominate by 2035.

MDI is the Army Intelligence Modernization Framework that increases the *Speed*, *Precision* and *Accuracy* of the Intelligence Cycle.



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v. 1.0.0 – 19 July 2022

## THE DATA LANDSCAPE

HQDA G2  
SCIENCE AND TECHNOLOGY



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# What should industry take away? -- Our Data Challenges

**We don't have a data problem.**

**We have a 'doing something useful with data' problem.**

**We have a 'is my data of high quality' problem.**

**We have a 'do I know where my data is going to make decisions' problem.**

**We have a 'how do I scale this to 225,000 ground vehicles' problem.**

**We have a 'who understands the data' problem.**

**We have a 'who can describe the problem' problem.**

**We have a 'why are we using static printed excel spreadsheets to make decisions about dynamic real-time systems' problem.**

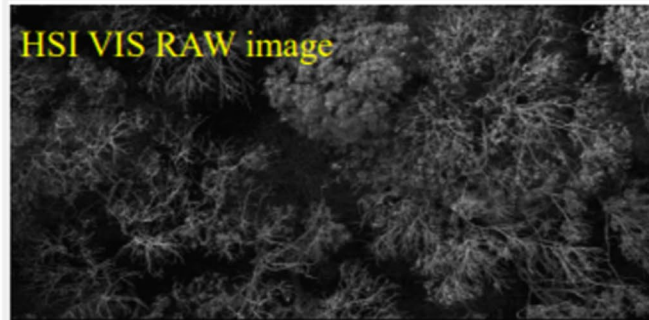




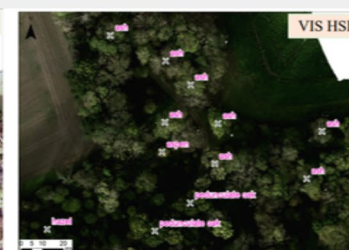
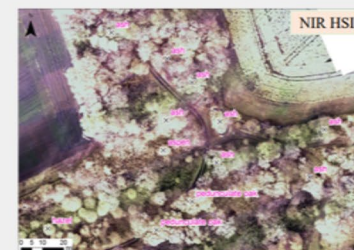
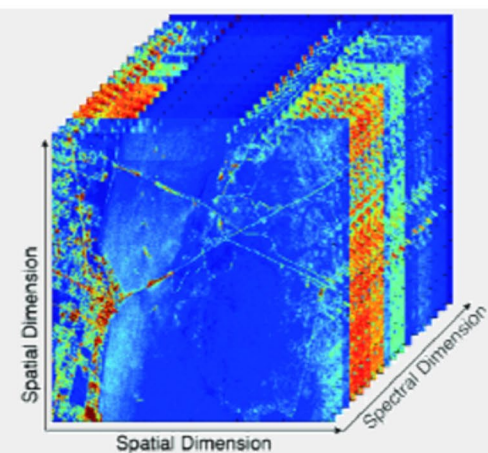
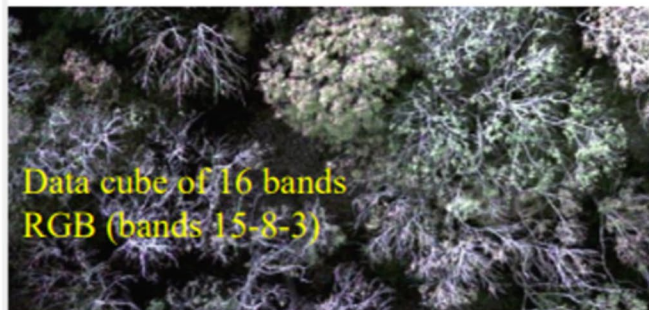




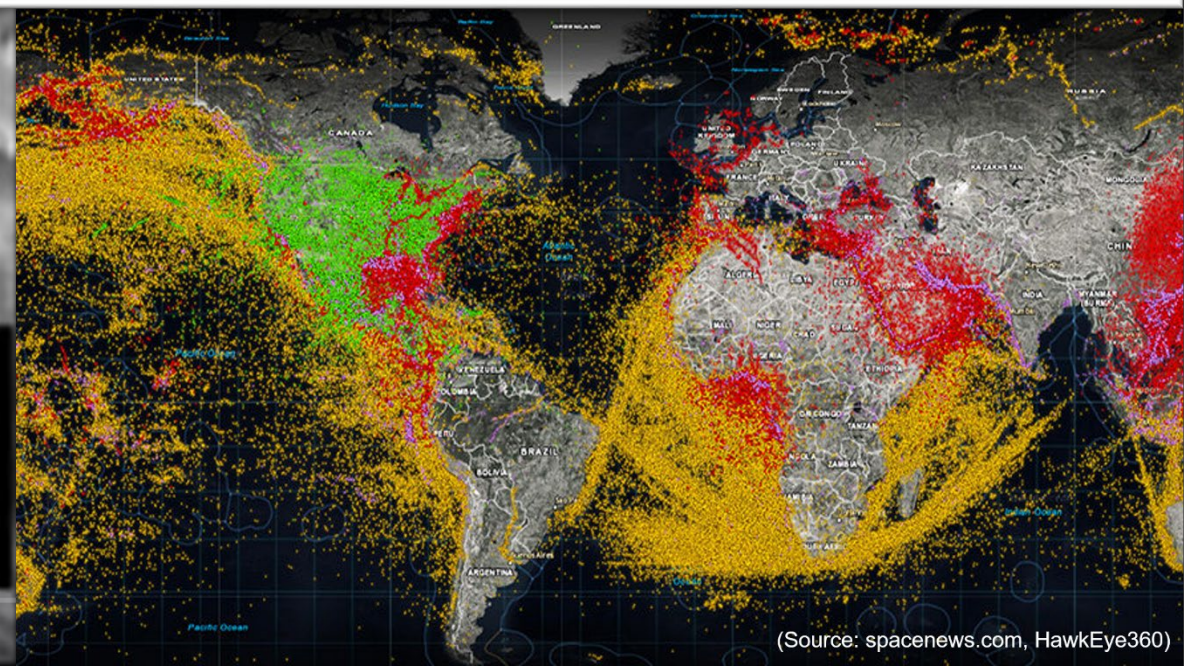
HSI VIS RAW image



Data cube of 16 bands  
RGB (bands 15-8-3)



(SOURCE: MELINA ZEMPILA \*, MICHELLE HAMILTON, HUGH MORTIMER RAL SPACE, STFC UKRI, RUTHERFORD APPLETON LABORATORY, HARWELL OXFORD, DIDCOT, UK)



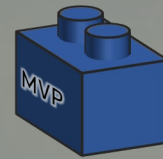
(Source: spacenews.com, HawkEye360)







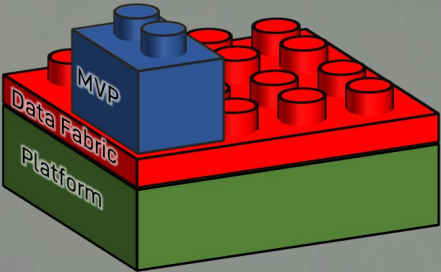
So how do we get better?





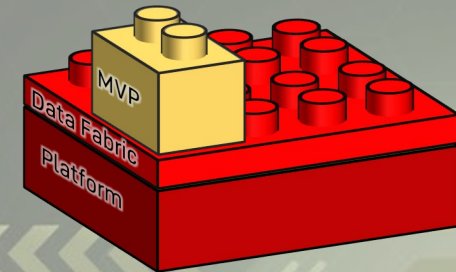
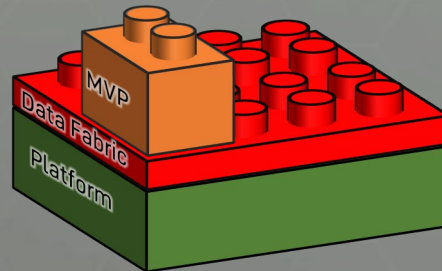
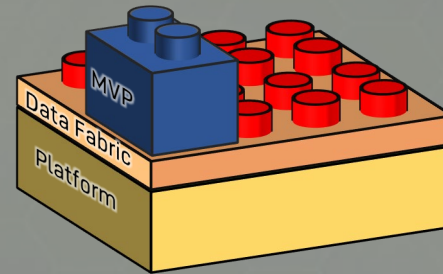
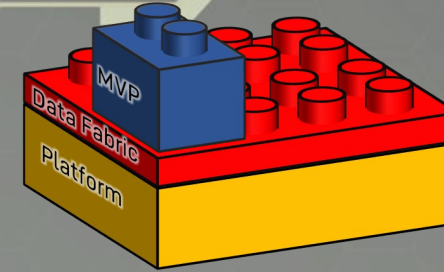
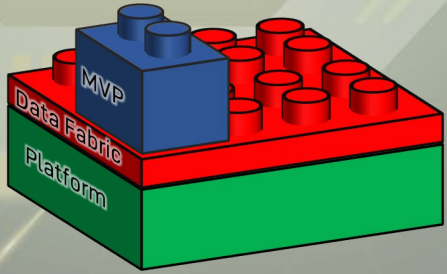


What does that mean for us?





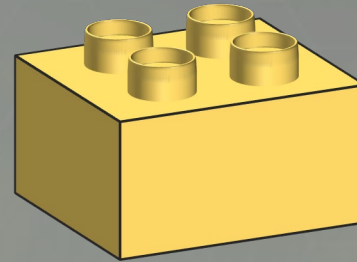
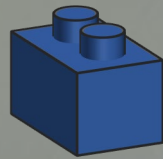
What does that mean for us?







So what's the big challenge?





# Questions?