Artificial Intelligence Task Force

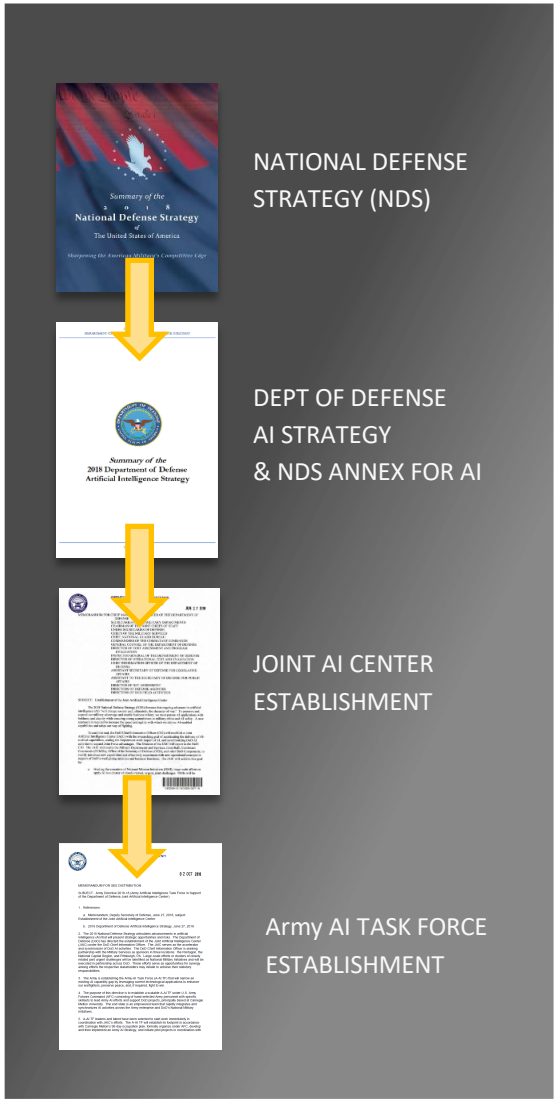
Army Artificial Intelligence Task Force (AI-TF)

Matthew P. Easley
A-AI TF Director

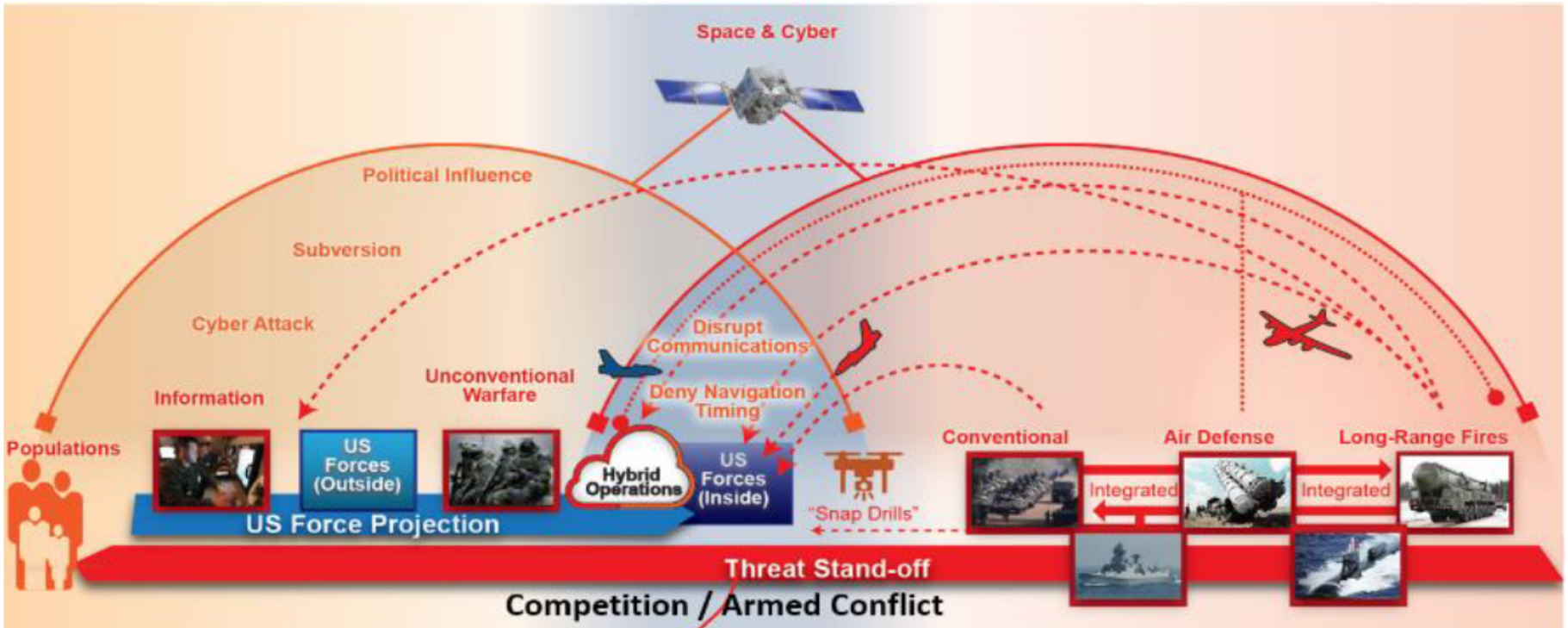
Supporting DoD AI Integration Efforts

- DoD has submitted its AI Strategy to Congress, the first annex to the 2018 NDS
- The Joint Artificial Intelligence Center (JAIC) is established with initial NMIs and focus on the Joint Common Foundation
- Realizing the full potential of AI will require major transformation for DoD
- The Army is organizing itself to integrate AI across all four mission areas
- Army AI Strategy is an annex to the DoD AI Strategy
- Developing Army Implementation Plan

The U.S. Army Artificial Intelligence Task Force leads, integrates, and synchronizes the Army AI strategy and implementation plan, key AI development efforts and sets the foundations for operationalizing AI within the Army Future Force Modernization Enterprise.



Penetrating Multiple Layers of Stand-Off



Threat seeks to separate friendly forces politically by fracturing alliances and partnerships through the integration of:

- *Diplomatic and economic actions*
- *Unconventional warfare*
- *Information warfare*
- *Conventional forces*

Threat creates stand-off by reducing speed of recognition, decision, and reaction

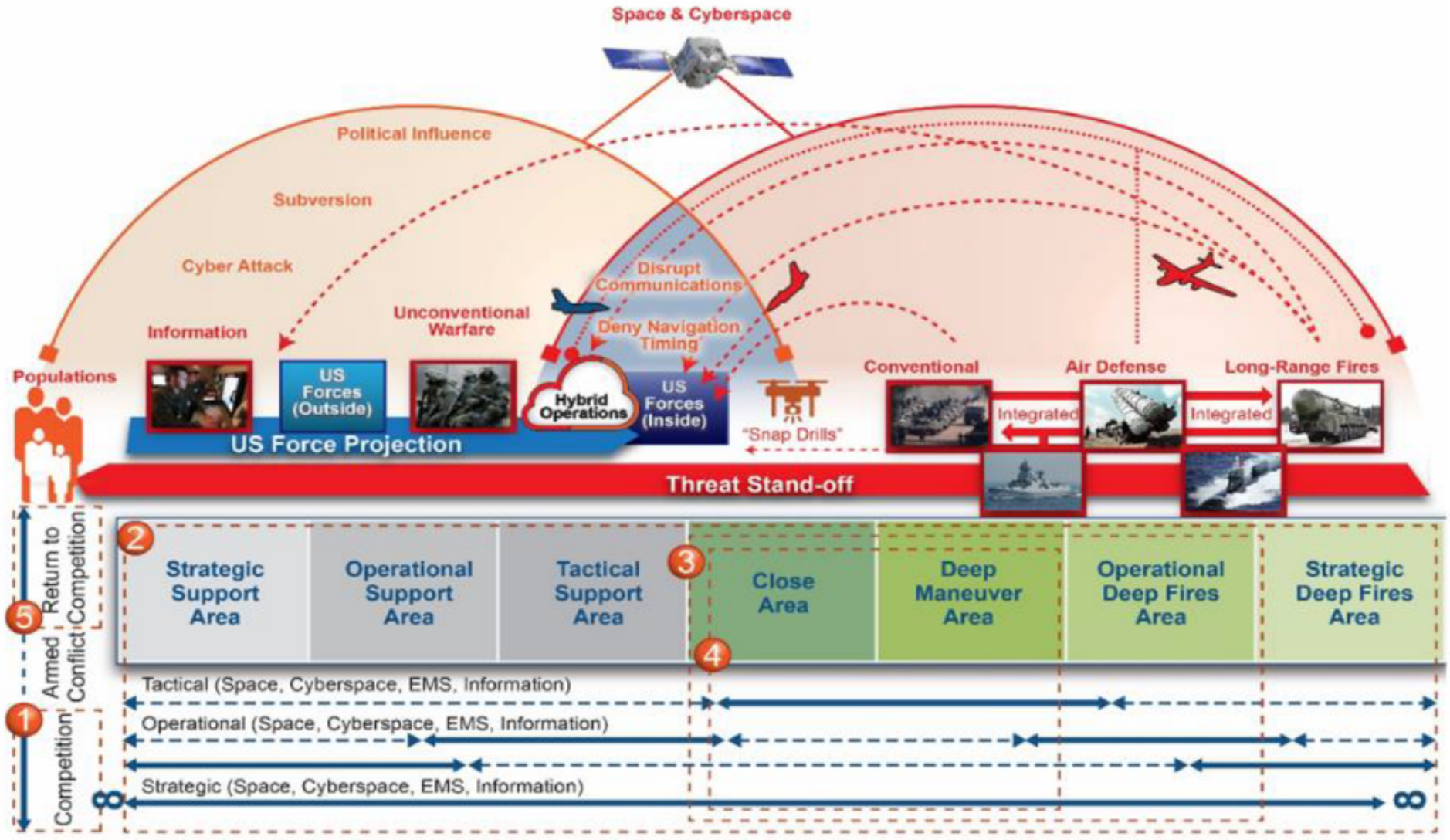
Threat seeks to separate friendly forces over time, space, and function through the integration of:

- *Long-range fires*
- *Unconventional warfare*
- *Ground-based air defense systems*
- *Electronic warfare, space, and cyber*

Threat creates stand-off by separating friendly forces over time, space, and function

Designed to capitalize on the predictability of the Joint Force, partners and allies

Multi-Domain Operations Defeats Stand-Off



1 *Compete* 2 *Penetrate* 3 *Dis-Integrate* 4 *Exploit* 5 *Return to Competition*

Operationalizing Artificial Intelligence

Realizing MDO requires robust, interoperable AI

Key observations. MDO requires:

- Processing high volumes of diverse data at tactical speeds (PED, targeting, sensor to shooter links, and deconflicting strike systems)
- Integrating airspace of increased number of system types
- Autonomous/semi-autonomous operations

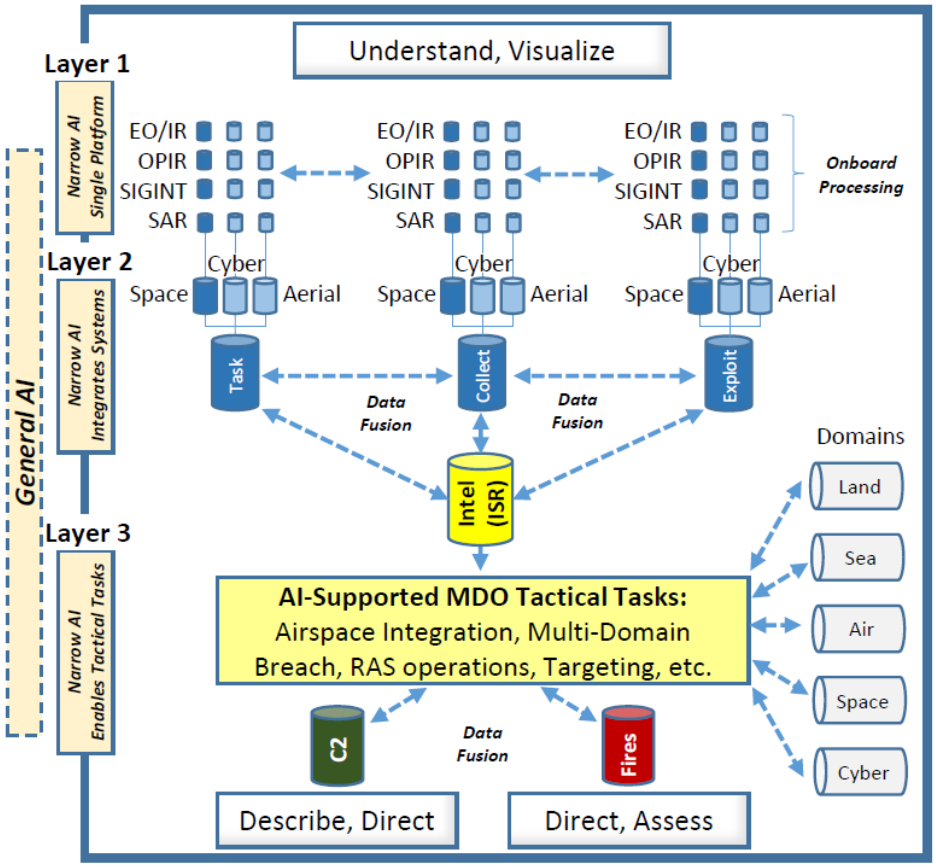
The issues:

- AI will operate in multiple layers and platforms, across a wide variety of data types to enable *MDO tactical tasks*
- Development of AI by numerous organizations adds *complexity* and *target surfaces* that may create risk

Mitigating AI development challenges:

- Create a strategic framework for AI study and development
  - Develop first order principles to operationalize AI
  - Identify and institute standards for Army AI development
- Develop AI as an aggregate of capabilities
- Invest in Data Science talent
- Foster a data-informed culture

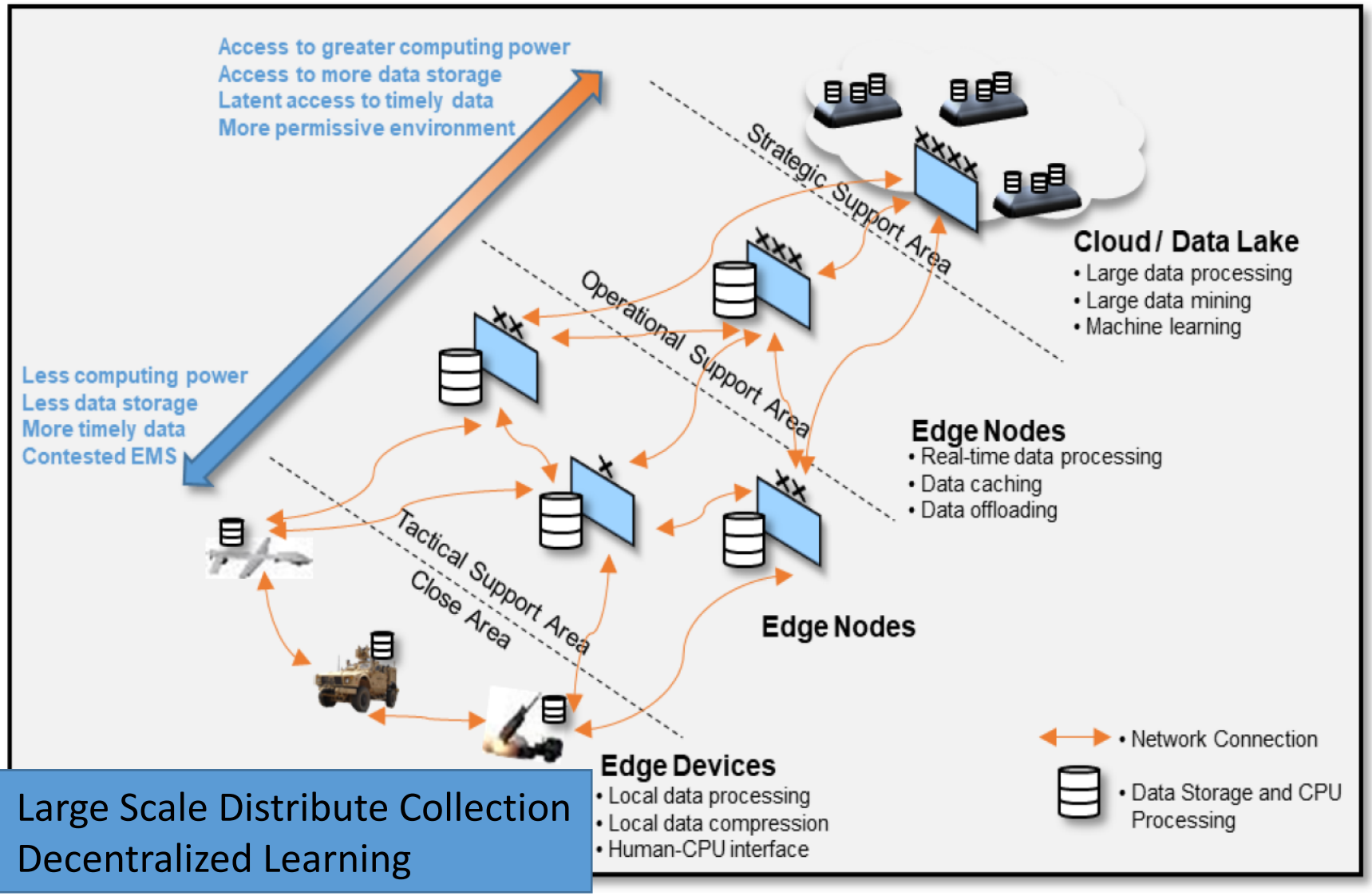
Networked AI for Intel (ISR), C2, & Fires



Military AI: *Complex problem – requires development standards and focused investments to mitigate future vulnerabilities and link AI-enabled systems/platforms to conduct MDO tactical tasks*

AI changes the character of war by enabling continuous convergence

Edge Processing and Data Transfers in the MDO Framework



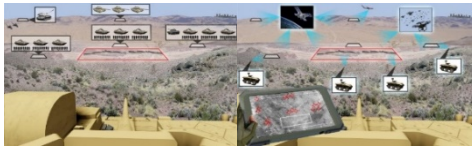
- Large Scale Distribute Collection
- Decentralized Learning

A-AI TF Overview & Strategy

- AI Requirements and Capabilities
  - Intelligence Support to Operations
  - Predictive Maintenance (PMx)
  - Mobile Cooperative and Autonomous Sensors (MCAS)
  - Talent Management (TM)
  - Support to CFTs and other Army agencies
  - Multi-Domain Operations (MDO) & Mission Command
- Evolve an Army AI Infrastructure
  - Establish the AI Hub
  - Develop tools for a replicable AI ecosystem
  - Extend Joint AI Center capabilities to Army
- Army Wide AI / Data Culture
  - AI education for the workforce
  - Ethical use of AI
- Set the Conditions for Army AI
  - Identify policies that impede deployment of AI technologies
  - Track AI spending across the Army

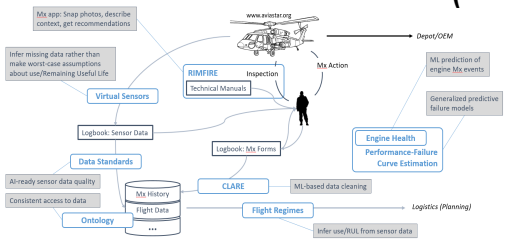
Initial Projects

Mobile Cooperative and Autonomous Sensors



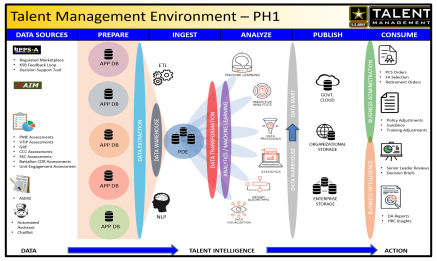
Through a network of air and ground-based sensors and systems, capable of operating in both a local network and integrated as a node in a greater architecture, detects and tracks threats, predicts threat behavior, and optimizes target engagement priorities while conducting tactical maneuver.

Predictive Maintenance (PMx)



Predict component failure before it occurs, so that remedial actions can be folded into the maintenance schedule, reducing unscheduled downtime and the probability of cascading failures that increase cost.

Talent Management

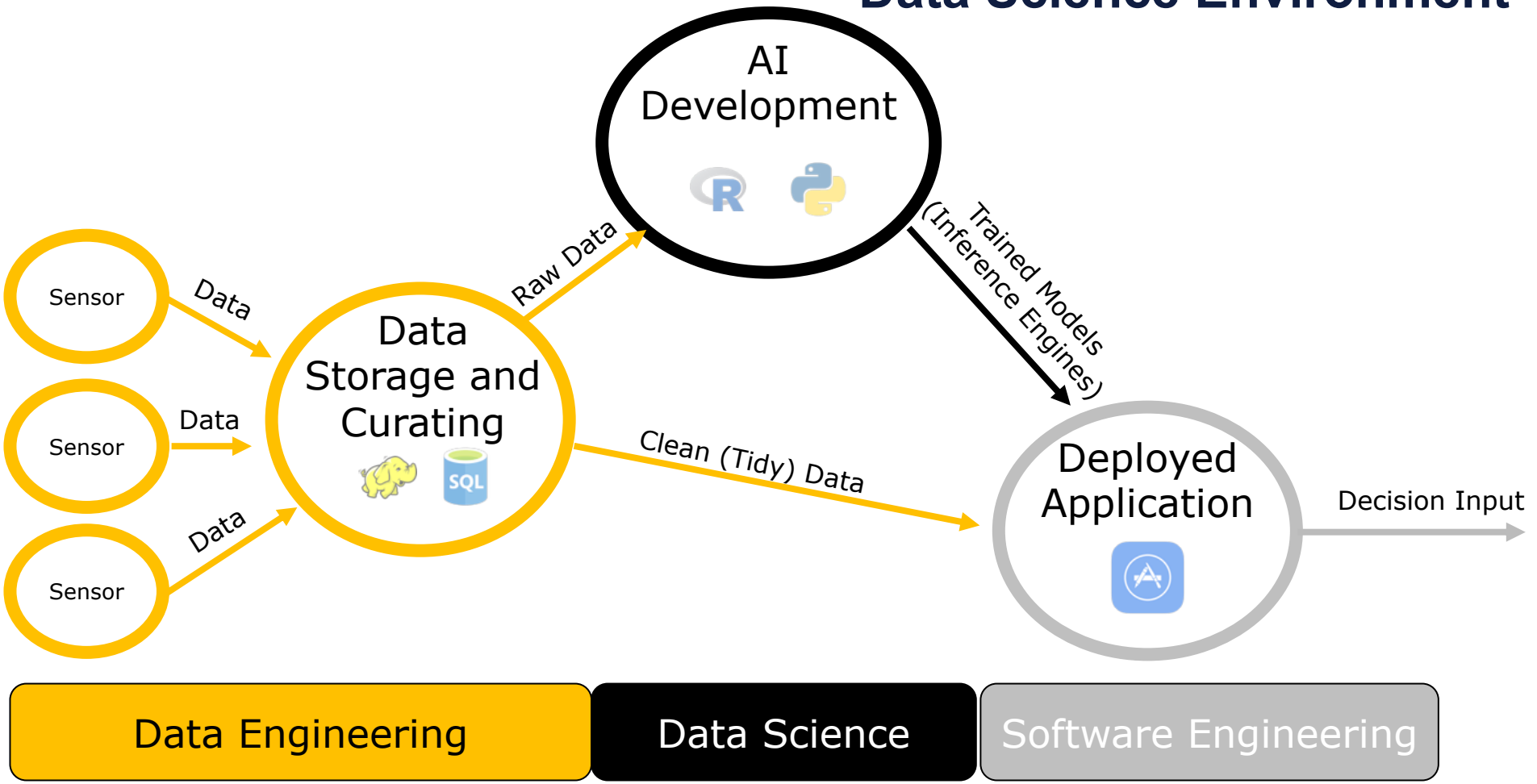


Talent Management seeks to use artificial intelligence to optimize management of Army personnel; both in the identification of talent and job performance requirements, and through the use of advanced analytic methods and models to inform career management through the Army's Talent Marketplace.

Intel Support to Ops

Augmenting Military Intelligence and Operations (Intel/Ops) with Artificial Intelligence Capabilities to enable Multi-domain Operations (e.g. LRPF) through automation of IPB, AI driven I&W and targeting, and AI-ready sensing.

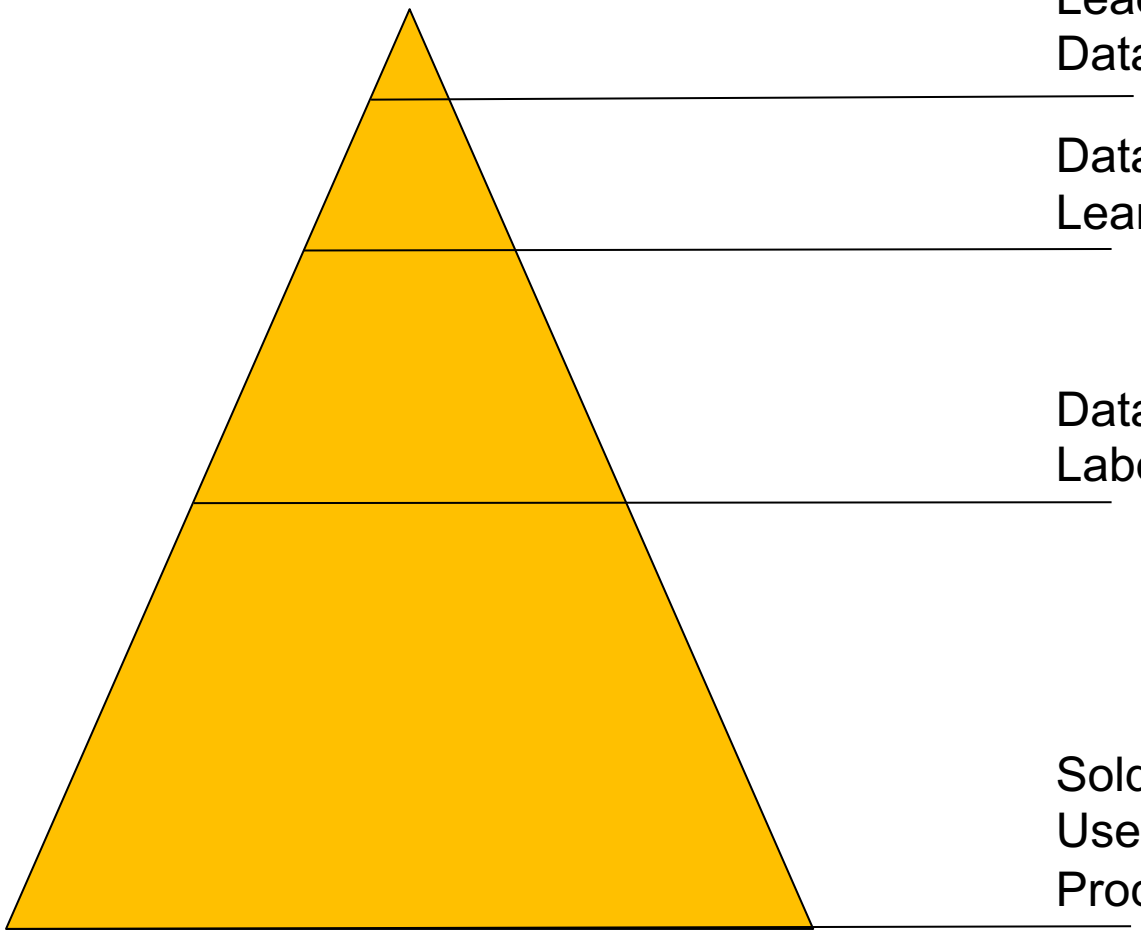
Artificial Intelligence Platform
Data Science Environment



Data Engineering | Data Science | Software Engineering

There are three main components of the AI platform. A place to store data (or access it remotely), development system where code is stored and environments are readily available, and production deployment.

Army's Data Workforce

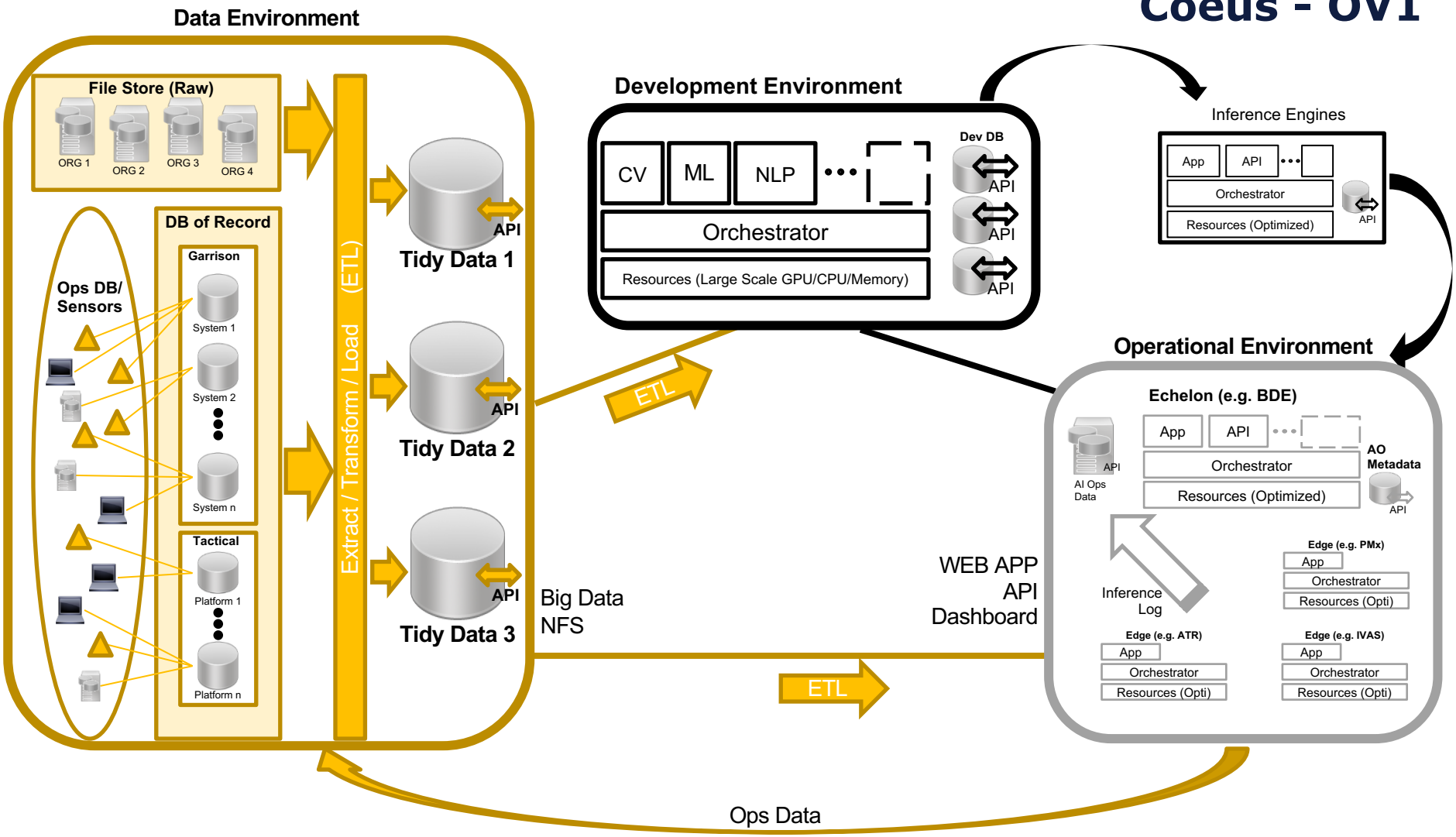


Every category of people within the workforce require access to data, training, and the appropriate tools.

Enabling Technologies and Concepts

	Cloud Services	On demand, managed, and scalable compute and storage system
kubernetes	Container Orchestration	AI development and deployment environment management
	GPU Infrastructure	Scalable infrastructure for training large scale ML models
	Edge AI Infrastructure	Model and application deployment to the edge
git	Code Management	Manage the code base for a portfolio of projects across a diverse development team
	DevOps and Agile Project Management	Manage scalable and iterative projects moving from MVP (minimum viable product) through continuous development/integration via the software development lifecycle (SDLC)

Artificial Intelligence Infrastructure Coeus - OV1



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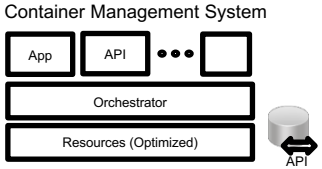

- Data System
- AI Development System
- Production System

- Tidy Data (D.S. Industry Term) – Data that is munged and ready to be used for AI/ML
- Inference Engine – Trained AI/ML algorithm

Artificial Intelligence Infrastructure
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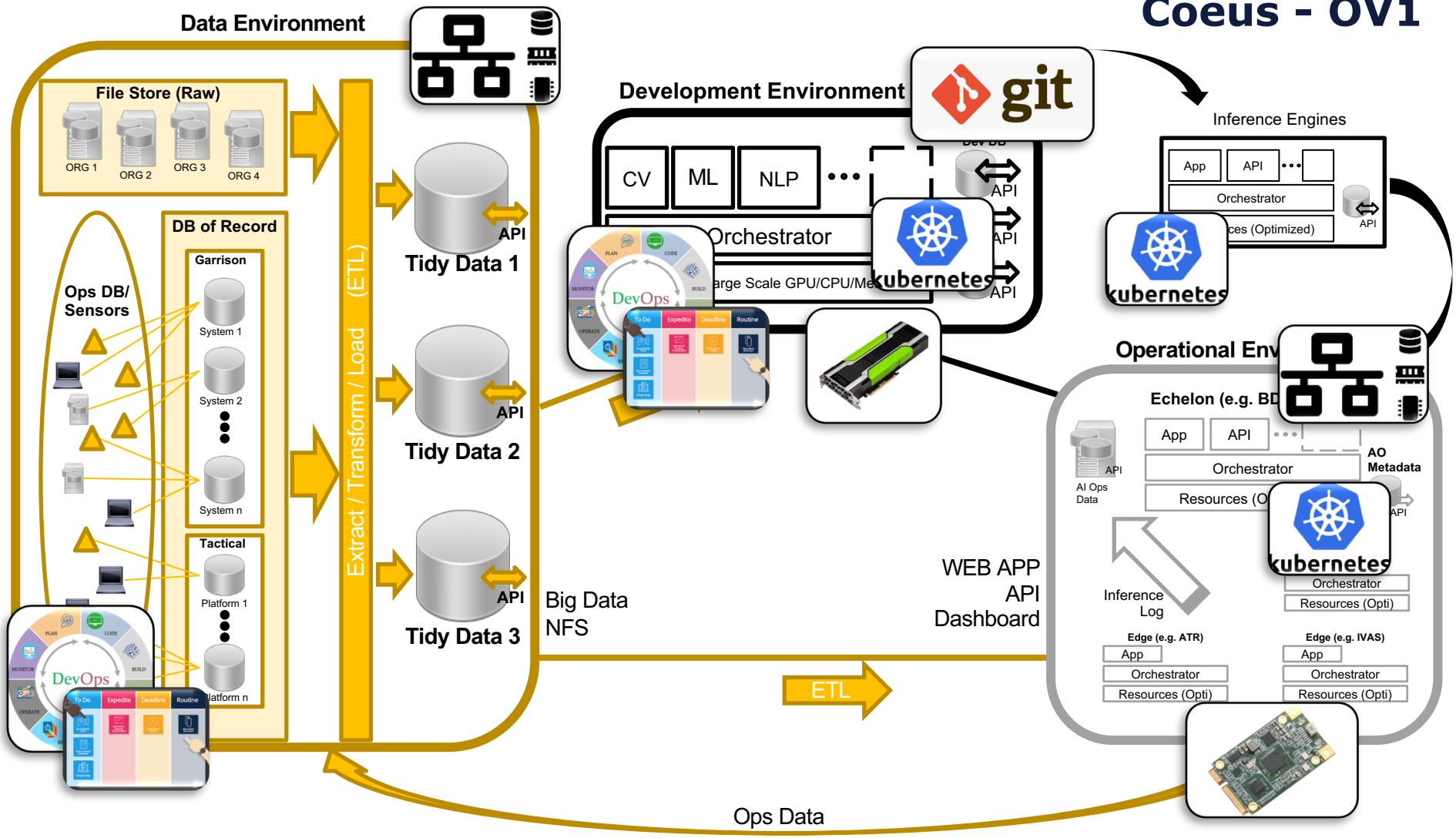

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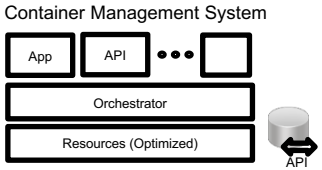

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Keys to Successful AI Implementation

- Use of common AI platforms, especially cloud technology
- Land warfare requires distributed infrastructure (edge computing)
- Rapid and continuous adaptability and improvement
- Curation of data, including truth labeling by humans; augmentation of real data with simulated data
- Architecture and infrastructure that support data flows and high performance computation
- Co-evolve operational concepts with technology, support rapid incorporation of user feedback and continuous model retraining
- AI-skilled human talent
- Trust and ethics

Build AI Ecosystem (Platform, Data, Tools, Analysts)


CONVERGENCE
ARTIFICIAL INTELLIGENCE TASK FORCE
LAYERED
CROSS-DOMAIN
ARMY FUTURES COMMAND
MISSION COMMAND

Questions

AI Hub

AI Hub Technology Accelerator

Technology Inputs

- **FFRDCs**
- **Academia**
- **Service Think Tanks** — dreamport, SOFWERX, NAVALX, AFWERX
- **Labs** — DEVCOM, DARPA
- **Industry** — AFCEA, NDIA

CCDC Labs

- **CFT Requirements Priorities**
- **Battle Lab Experiments Assessments**
- **Industry Events** — ARMY APPLICATIONS LABORATORY

AI Hub Technology Adopter

- **Expedite Delivery** — PROTOTYPE RCCTO RAPID DELIVER
- **Program Integration**
- **Sustainment**
- **CCDC Refinement** — DEVCOM