



Accelerating Digital Transformation for our Soldiers

AFCEA NOVA Army IT Day 2024

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Accelerating **Digital Transformation** to Enable **Decision Advantage**



Army #DigitalOdyssey Enablers

Data Mesh / Unified Data Reference Architecture (UDRA)

Modern Software Practices

Modular Open Systems Approach (MOSA)

Artificial Intelligence / Machine Learning

Cybersecurity

Digital Engineering

Training / Upskilling

Software Modernization

Defense Business Systems Pathway

DoD Instruction 5000.75: “Business System Requirements and Acquisitions” **10 USC 2222:** Defense business systems: business process reengineering; enterprise architecture; management

Applicability: Defense Business Systems (DBS)

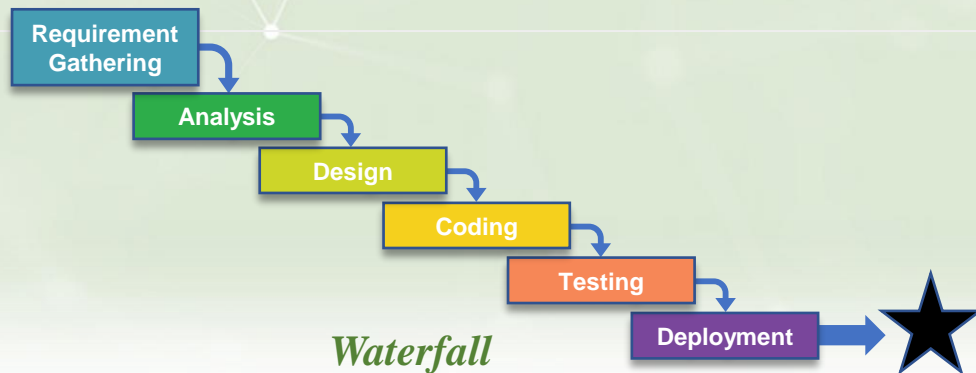
Phases: (5) – 1: Capability Need Identification, **2:** Business Solution Analysis, **3:** Business System Functional Requirements and Acquisition Planning, **4:** Business System Acquisition, Testing & Deployment, & **5:** Capability Support

Entrance Criteria: Phase 3 – Functional Requirements & Acquisition Planning Phase requires validation that sufficient BPR was done, capabilities reqs document was developed, funding is available and approves execution of the activities outline in the capability implementation plan

Reporting: **Acquisition Program Baseline** is the contract between the PM and the MDA for managing cost, schedule and performance

Documentation: 15 Statutory and Multiple Regulatory documents required

Speed Of Relevance: Traditionally characterized by a waterfall development methodology that deploys capabilities in a big bang release approach every several years. Typically faces technology obsolescence



Software Acquisition Pathway (SWP)

DoD Instruction 5000.87: “Operations of the Software Acquisition Pathway” (SWP)

Applicability: SWP includes Applications, Embedded Systems Software and now DBS

Phases: (2) – 1: Planning and **2:** Execution

Entrance Criteria: Phase 1 - Planning requires the Decision Authority (DA) Acquisition Decision Memorandum (ADM) authorizing use of the SWP & Execution Phase as well as a Capability Need Statement (CNS)

Reporting: **Not managed by an Acquisition Program Baseline** to monitor cost, Schedule and performance. No ATP Decision Points. User Agreement between PM and User Community outline User Engagement Opportunities to include involvement in annual Value Assessment Reporting

Documentation: 9 Statutory and Multiple Regulatory documents and Regulatory Planning Phase requires Strategies for: Acquisition, IP, Cybersecurity, Test, Product Support and Cost Estimates

Speed Of Relevance: Features modern software development methodologies that deploys capabilities in an agile, iterative release approach at least annually. Provides the ability to update systems rapidly and reduces technology obsolescence



Software Metrics (Core metrics)

Standardized quality metrics are being defined and implemented quantitatively to help programs and partners align on expectations and consistently measure success.

Category	Metric Name	Description	Importance	Measurement	Trend Over Time
Software Process Metrics	Velocity	Amount of work the team completes during a given period	Key planning factor for estimating the amount of work that can move through the CI/CD Workflow	$= \frac{\# \text{ of Story Points [Complete]}}{\text{Sprint}}$	Increases
Software Quality	Defect Rate	Number of defects created during a set interval	Improve the quality processes in the delivery flow	$= \frac{\# \text{ of Defects}}{\# \text{ of Deployments}}$	Decrease towards 0
Software Quality	Recidivism Rate	Percent of work returned to the developer for various reasons within the CI/CD Workflow	Indicates effectiveness of execution and adherence to acceptance criteria	$= \frac{\# \text{ of Story Points [Returned]}}{\# \text{ of Story Points [Completed]}}$	Decrease towards 0
Software Development Progress	Delivery Frequency	The frequency that changes are delivered to production/ operationally relevant environment (ORE)	Reduce the size of delivered change, improve the feedback loop on quality and increase the speed of value delivery.	$\# \text{ of Deployments to Production}$	Increases
Cybersecurity	Mean Time to Remediate	The average time it takes to repair/restore a module, component, system to functional use after a security incident	Time to respond cyber threats is critical to the security and protection of the system/data	$= \frac{\text{Time to Resolve}}{\# \text{ of Incidents}}$	Increases
Cost	Cost Per Release	Shows the cost per release to trend over time and to compare against the value delivered per release	Provide insight into cost per delivery of a feature / capability	$= \frac{\text{Total Cost To Date}}{\text{Total Delivered Features}}$	Decreases
Value Metrics	Level of User Satisfaction	This metric represents the degree of user satisfaction based on the value delivered by the product or solution.	Ensuring the user wants to use the product	$= \frac{\text{Sum of Satisfaction Scores}}{\# \text{ of Respondents}}$	Increases

Software Metrics (Optional Metrics)

Category	Metric Name	Description	Importance	Measurement	Trend Over Time
Software Process Metrics	Cumulative Flow	Shows: 1) # of stories created over time 2) # of stories completed over time 3) amount of work in progress over time	Indicates information about the amount of work moving through the team's workstream show the health of the development cycle	Diagram Showing History of: $\begin{matrix} \# \text{ of Stories in Backlog} \\ \# \text{ of Stories in Progress} \\ \# \text{ of Stories Completed} \end{matrix}$	Backlog not excessively growing, and work in progress remains consistent to the number agile teams
Software Quality	Code Coverage	Unity and Automated Test Coverage	Best efforts made towards a bug free codebase that is repeatable build / deployment methods	$= \frac{\# \text{ of Lines of Code Executed}}{\text{Total Number of Lines of Code}}$	Increases
Software Quality	Change Fail Rate	The percentage of changes to the production system that fail	Identifies changes that fail in production	$= \frac{\# \text{ of Change Failures}}{\# \text{ of Deployments}}$	Decreases
Software Development Progress	Progress Against Roadmap	Rate features on the roadmap are delivered as planned	Ensuring Work Planned is being delivered on Time and in an acceptable manner	$= \text{Features Released on Time vs Quarterly Roadmap Dates}$	Increases
Cybersecurity	Mean Time to Detect	Amount of time it takes to discover a security incident/threat	Identifies time taken to detect cyber threats critical to the protection of the system	$= \frac{\text{Total Time Between Detection}}{\# \text{ of Failures}}$	Decreases
Cost	Cost Per Agile Team	This metric shows the cost of Labor Costs per Agile Team + Non-Labor Costs Per Agile Team to develop and deliver value to the customer	Identifies costs related to the entire agile team taken to get a release to the customer	$= \text{Agile Team Costs} + \text{Non Labor Costs}$	Decreases
Value Metric	Net Promoter Score	Customer satisfaction score that demonstrates if customers would recommend your product to other users	Identifies customer promotability of a feature	$= \% \text{ Promoters} - \% \text{ Detractors}$	Increases

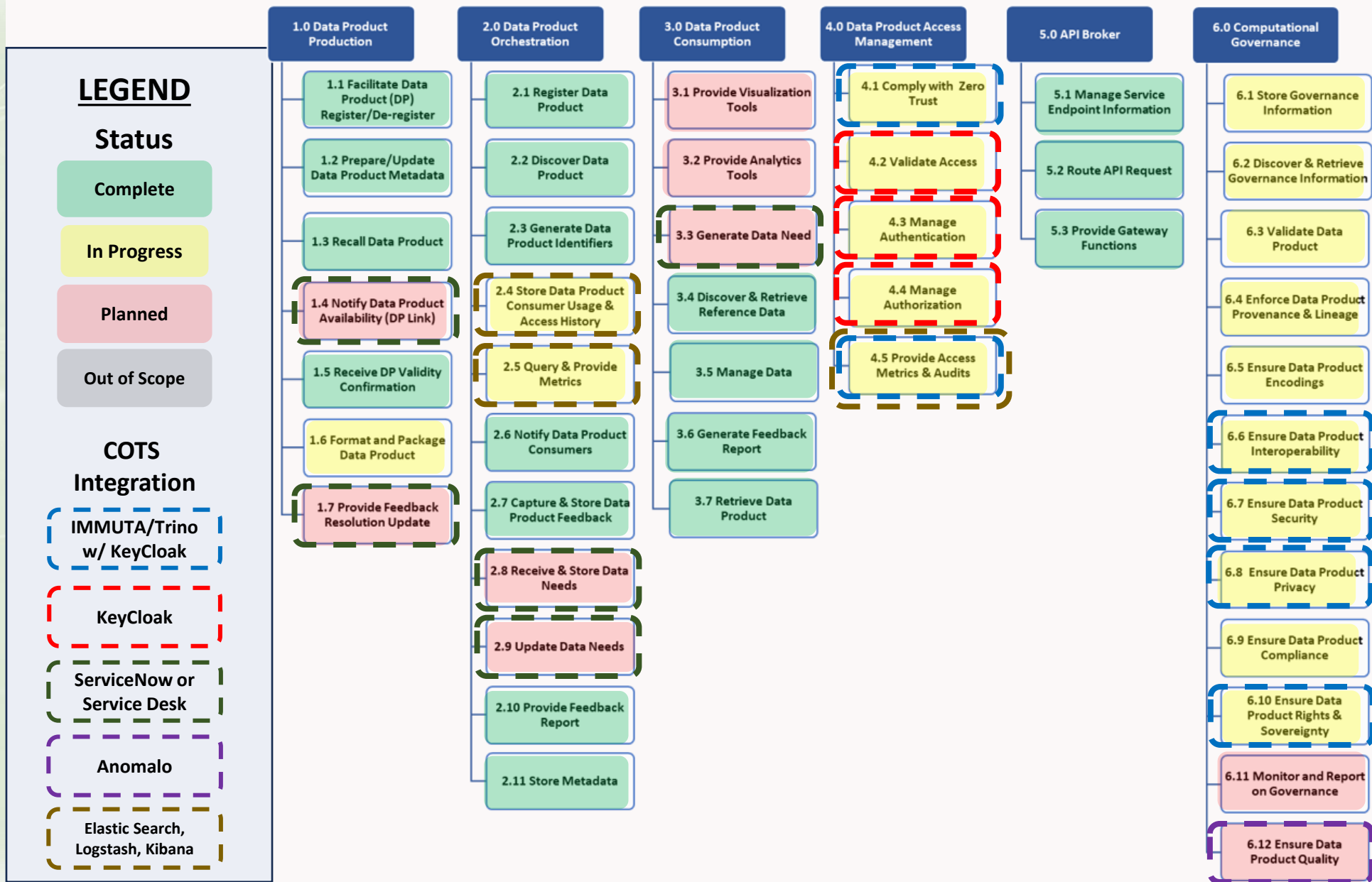
UDRA / UDRI

UDRA 1.0 is complete!
Strong collaboration with Industry helped simplify services from 14 top level services to 6.

UDRI is over half done
Current MVP access to Innovation Exchange Lab enabling us to enlist vendor support to help prove implementation plan (Targeting March FY24)

100-day plan underway & will identify specific programs to begin implementing UDRA to the extent possible & will include roadmaps to make significant progress in FY24.

500-day plan in development



PCTE

FIRST EVER TO receive operational test approval authority with DOT&E oversight and is also able to use vendor test data for reciprocity to satisfy operational test requirements.

Overview: Persistent Cyber Training Environments (PCTE) enables realistic training with variable conditions to increase readiness and lethality of our Cyberspace Operations Forces, while standardizing, simplifying, and automating the training management process.

Led by: PEO STRI's PM Cyber, Test & Training (CT2)

- ✓ Agile Methodology
- ✓ Quantifying quality
 - Release frequency
 - Defect rate
 - Sprint velocity
 - Recidivism Rate

CYBERCOM - dynamically prioritizing requirements to enable fast and cyclical releases aligned with priorities

MOVING FAST with the CI/CD and SWP approach, planning for first capability release in FY25 with continuous delivery for future capabilities, versus an initial limited deployment in FY26 using the waterfall approach

Overview: Enterprise Business Systems – Convergence (EBS-C) is the Army’s business modernization and transformation effort to simplify, streamline, standardize and unify business operations while improving auditability.

Led by: PEO EIS, EBS-C PMO

- ✓ Agile from the acquisition stage - evaluating company agility and not just solution
 - Approval Criteria during Acquisition – we created a 7 – step evaluation to enable agility during execution:
 1. Whitepaper down select vendors with invite to Step 2
 2. Oral and Demonstrations
 3. Technical Exchange - down select to 3 vendors for award and invite to Step 4--Prove out hardened
 4. Infrastructure and CI/CD pipeline - down select invite
 5. Demonstrate Data Transition and Mock Human Centered Design/Agile Implementation (Throughput/Velocity)
 6. Technical Exchange with government identified best value team for Step 7
 7. Determination of Best Value Team and technical solution environment; Perform Data Foundation and MVP iterations towards Initial Limited Deployment
- ✓ Prototyping with multiple vendors to build CI/CD infrastructure
- ✓ Continuous testing and evaluation throughout CI/CD process - Agreement by DOT&E to Pilot DOT&E modern software development process changes with the program

FOR THE FIRST TIME, we're tying predefined metrics to payment, incorporating FFP Expedited Delivery & Enhanced Performance CLIN if meeting/exceeding contractually defined "very good" performance standards

Overview: Integrated Personnel and Pay System for the Army (IPPS-A) released their Army Military Payroll (AMP) DRAFT RFP focused on identifying a partner to help develop a solution using the Oracle PeopleSoft Global Payroll application.

Led by: PEO EIS, PM IPPS-A

- ✓ Agile from the acquisition stage
- ✓ Quantifying quality – Quality Assurance Surveillance Plan (QASP)
 - Soldier Satisfaction
 - Timeliness
 - Accuracy
- ✓ Going more digital by revising deliverables to be developed using wikis that are shared through software development environments
- ✓ Integrated user feedback is driving Soldier-prioritized services faster, delivered in manageable functional modules
- ✓ Delivering dashboards to provide visibility for senior leaders and pay management

Modified entire project team structure & vendor structure to ensure alignment towards and successful execution of Agile methodology – better managing PIs, metrics, and more.

Overview: The Joint Common Access Platform (JCAP) will allow DoD cyber operators to connect to their targets beyond friendly firewalls. The software platform supports Cyber Command's offensive, defensive and mission support teams by projecting combat power using a comprehensive suite of tools.

Led By: PEO IEW&S, PM Cyber & Space (C&S)

- ✓ Agile methodology from the acquisition phase
 - Collaboration with ACC to select award fee (CPAF) structure to tie fiscal outcomes to cost, schedule and performance per Program Increment (PI)
 - Feature Completion serves as the primary metric for PI performance
- ✓ Quantifying quality
 - Velocity (amount of work the team completes during increments)
 - Sprint Burn Down (pace of work completion during increments)
 - Predictability (planned-to-done ratio per sprint)
 - Delivered Features (progress of backlog and delivery of products to Warfighter)

GROUND-BREAKING for a joint program, CSC2 will release capabilities, prioritized and packaged by user set and agile tenets, to a user community and then scale

Overview: CBRN Support to Command and Control (CSC2) program will allow a common operating picture that provides commanders the ability to integrate CBRN expertise and knowledge into all echelons to make informed decisions, regardless of whether there's a CBRN subject matter expert within their ranks by providing integrated situational awareness about potential CBRN hazards to inform decision making. CSC2 will link sensors together to develop networked tools that communicate and share information to achieve integration of CBRN capabilities and data with existing user systems across the services.

Led by: JPEO-CBRND's Joint Project Lead for CBRN Integration

- ✓ Prioritizing user-centric approaches for capability development, feature prioritization and continuous feedback for the delivery of functional capabilities
- ✓ Leveraging Agile battle rhythm to deliver more frequently and incrementally, getting the right capabilities into the users' hands faster
- ✓ Automated testing & improved coordination with ATEC to plan operational test & fielding for incremental releases
- ✓ Planning to incorporate testing automation and fiscally tying agile metrics and process improvement to performance in future contracts

ENABLING OUR FIRST pilot for an MLOps solution that could be scaled across the Army, TITAN is helping the Army move towards a more open and modular approach and steer away from vendor lock

Overview: TITAN is an intelligence ground system, designed to help the Army connect data-gathering sensors to shooters in the field to support advanced beyond-line-of-sight targeting.

Led by: PEO IEW&S, PM Intelligence Systems & Analytics (IS&A)

- ✓ Moving to a MOSA architecture → removing the Vendor Lock in both Data Rights and Service Architectural Capabilities
- ✓ Interoperability is key to accessing the right information regardless of data source
- ✓ Development of HYDRA – open API specification to address data exchange between PM IS&A portfolio regardless of COTS acquisition strategy

Project Linchpin

The architecture, standards, governance, and processes developed by Project Linchpin will serve as a foundation for the delivery of trusted AI capabilities to programs across PEO IEW&S, with lessons learned informing trusted AI delivery across the Army.

Overview: Project Linchpin (PL) creates a collaborative but competitive ecosystem of industry partners to establish a secure MLOps pipeline and AI Services to deliver trusted AI for intelligence, cyber, situational awareness/situational understanding, and electronic warfare sensor systems within the PEO IEW&S portfolio.

Led by: PEO IEW&S Product Team

- PL initiated into a Program of Record into the Adaptive Acquisition Framework Software Pathway Planning Phase in Nov 2023
- PL will enable programs to take algorithms from anywhere securely and effectively leveraging:
 - Open architecture for plug & play capability
 - Test & eval / Verification & validation standards for robust testing & associated metrics
 - Risk Framework (in development)

THE FIRST ARMY GCS program to decouple hardware and software development, RCV is working to enable “best of breed” acquisition approach that will deliver a modular system architecture with interoperability.

Overview: Robotic Combat Vehicles (RCVs) are a new capability that will forever change the conduct of warfare by integrating technology into in the battlefield with uncrewed combat – enabling commanders to employ external or onboard weapon systems while reducing the aggregate tactical risk by having robots, not our soldiers, make first contact with the enemy.

Led By: PEO Ground Combat Systems (GCS)

- ✓ MOSA approach – break apart what are tightly integrated solutions today to enable “plug and play” for the right components for the right capability and not have to buy the whole thing from one provider who might be the best fit for only one or some of what our Soldiers need
- ✓ Interoperability – The program is looking to collectively integrate the best tools and capabilities across vendors to ensure the best materiel solution for fielding our Warfighters
- ✓ Through insights gained from users and support from vendors, we’re moving towards the ability to integrate different modular payloads across multiple vendors
- ✓ Software Pathway will provide continuous capability improvements in autonomous movement, user interface / control and multi-mission payload control

Next Generation C2

The requirement is being informed by Industry best practices so the Army can remain a "fast follower" and adopt both technologies and processes give commanders the ability to get the right information to make better decisions, faster.

Overview: Next Generation C2 is not a single materiel solution or even a suite of solutions. Next Generation C2 is really about the Army's planning to deliver Command and Control services to units and commanders. This is intentional: "C2 (command and control) is not the same as C3 (command, control, and communications)"

Tenets include:

- ✓ MOSA - Modular open systems approach (MOSA) for architecture
- ✓ DSO - Modern software/services/microservices delivery approaches like DevSecOps
- ✓ MBSE/DE and Data Management - Digital engineering to deliver systems that enable modern data management - emphasis on data standards, access, policies and procedures
- ✓ Simplicity - Reducing complexity of legacy systems and associated impacts on the network, bandwidth, EMS, and physical signature
- ✓ Intuitiveness - Systems must enable operations and not create additional burdens on Soldiers to use and maintain
- ✓ Systems should also automate processes, including data management and analytics to the greatest extent possible – requiring integration of AI/ML, cloud computing and storage, and spectrum management



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The Army Needs Partners To Help Solve Hard Problems