

BAA Update

Topic: Activity Registry and Common Course Catalog

Across the Department of Defense (DoD), training and education systems historically use pre-determined, point-to-point connections and manual intervention to share actionable information relating to requirements, curricula, and student performance across systems. This requires integrators to customize each system to get the data out of one and into another, and human processes to analyze and correlate it. This is especially true with the way we catalog and archive different types of instructional activities including digital content, instructor-led courses, simulations, and other learning opportunities. This is complicated in that a single entity does not own all training and education content and therefore can only publish catalogs (e.g. CANTRAC) for the courses they own.

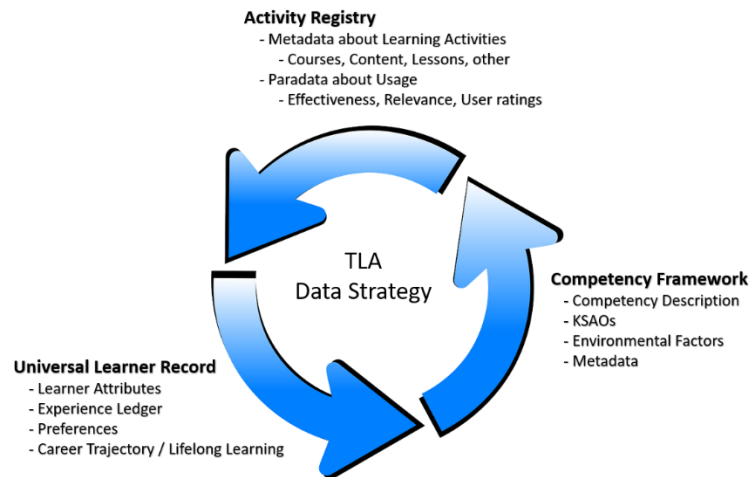


Figure 1. *The TLA Data Strategy aligns ongoing modernization efforts across the DoD's training and education enterprise*

In the face of numerous, varied, and complex information sharing challenges facing the DoD, the DoD Chief Information Officer (CIO) has set a vision to deliver an Information Enterprise (IE) that enables DoD and partners to securely access data and information services they need at the right time and place, and on approved devices of their choosing. The DoD Net-Centric Data Strategy provides the basis for implementing and sharing data in a net-centric environment. It describes the requirements for inputting and sharing data, but it does not accommodate the myriad of complexities associated with today's training and education environment. The Total Learning Architecture (TLA) data strategy summarized in Figure 1, along with the related common course catalog from the DoD Chief Management Officer, build upon the DoD Net-Centric Data Strategy's goals of making data assets visible, accessible, secure, and understandable. This approach establishes services as the preferred means by which information producers and capability providers can make their data assets and

associated operational activities available across DoD and beyond. It also establishes services (i.e. data contracts and manipulation business logic) as the preferred means by which consumers can access and use these data assets and capabilities.



As envisioned, this research will focus on identifying, enhancing, or developing the standards and specifications necessary to create a federated data framework that allows individual DoD components to manage their own learning resources via an Activity Registry that rolls up (i.e. federates) into a Common Course Catalog. The key attributes of this research include:

- Ensure data about learning resources is visible, secure, available, and usable when needed and where needed to accelerate decision-making. Predict and inventory requirements for learning activities (e.g., courses) to meet the demands of DoD consumers while minimizing the duplication of course development efforts.
- Align with the DoD Discovery Metadata Specification (DDMS) which specifies how to use metadata to make data assets visible across the enterprise.
- Automate the ability to align content with competencies, generate and manage paradata, perform semantic search services, and create machine-actionable metadata that roll up from local Activity Registries into a single Common Course Catalog.
- Align ongoing initiatives from the DoD CIO, CMO, and the Chief Data Officer with the needs of the training and education community, while providing guidance to ongoing training and education modernization efforts across DoD.

The ADL Initiative invites white paper proposals to address these issues through the following tasks:

- **Task 1: Definition/Validation of the learning activity metadata elements including content, courses, exercises, and other formal learning activities common across the DoD.** Identify an approach for describing various learning activities a learner will encounter across the continuum of lifelong learning. Investigate various metadata formats, standards and specifications to inform an approach that describes content in support of the Future Learning Environment. Create an approach that considers machine-learning created metadata (for example, relevance and engagement) beyond the more commonly available human-specified attributes. This task includes consideration of metadata storage and retrieval methods across the myriad of T&E commands within DoD (e.g., Activity Indices). The deliverables would include both Metadata Strategy and Metadata Guidance.
- **Task 2: Definition/Validation of learning activity paradata elements (data about usage).** Identify a taxonomy and approach for gathering, verifying, storing, and sharing paradata within an Activity Registry. While metadata classifies properties about the learning resource, paradata involves the collection and open sharing of in situ information about users' actions, preferences or experiences related to the resource. Paradata is generated through user processes of searching for



content, identifying interest for subsequent use, correlating resources to specific learning goals or standards, and integrating content into educational best practices. The deliverables would include both Paradata Strategy and Paradata Guidance.

- **Task 3: Coordinate with DoD CIO to review existing architectures, systems, services, and capabilities.** Identify and document new technical architecture to support the Common Course Catalog. Identify best practices for managing a federation of activity registries that encompasses all the different types of learning activities an individual might encounter across the continuum of learning. Discuss different approaches that might be required for different types of instructional content. Identify approaches for rolling multiple activity registries (e.g., each service, schoolhouse, or DoD component) into a common course catalog. The deliverables would include a Logical Architecture with current and forecasted.
- **Task 4: Create prototype activity registry and common course catalog capability.** Coordinate with ADL Initiative stakeholders (e.g., USALearning, the Armed Services, other DoD components) to define functional requirements of the prototype system. Design a minimally viable capability for testing and demonstrating key features. Develop a prototype capability for capturing, connecting, federating, and sharing data about learning resources available to an organization. Key features should include the ability to generate and manage content metadata, manage taxonomies and ontologies, alignment of content with competencies, generate and manage paradata, perform semantic search services across federated activity registries at scale. Desired outcome includes a documented path for developing, evaluating and transitioning a common course catalog and activity registry. Deliverables would include a Requirements Traceability Verification Matrix (RTVM), Software Product Design, and Source Code.
- **Task 5: Applied testing and demonstration.** Create and execute an iterative test plan that maximizes use of best practices, agile development methodologies, and the maturation of features and capabilities through continuous process and product improvement. Coordinate with the ADL Initiative and its stakeholders to identify operationally relevant environments for where testing may take place. Deliverables would include a Test & Evaluation Plan (TEP) and Test results.
- **Task 6: Reports and Documentation.** A final report, due 30 days prior to end of the contract, will summarize lessons learned and best practices, provide insight into features and capabilities, summarize the testing outcomes, and provide a detailed roadmap for next steps required in support of transitioning to an operational capability. Deliverables would include a System Test report, Monthly reports and a Final Report.