ADL Initiative • FY20 Broad Agency Announcement Topic

cmi5 Player and Test Suite

Problem Statement. *The cmi5 specification was created to replicate SCORM functionality, with the intention of replacing SCORM as the de-facto format of online courses and traditional computer-based training. However, Department of Defense (DoD) requires a minimally viable cmi5 player reference implementation and a software conformance test suite for cmi5-based content to enable its transition into operational use.*

Background: Developed nearly two decades ago, the Sharable Content Object Reference Model (SCORM) is a set of interoperability standards for packaging and delivering online courses via web-browsers and Learning Management Systems (LMSs). However, SCORM is not extensible enough to support the myriad of technologies used in modern learning environments, and SCORM does not provide sufficient guidance for capturing robust, interoperable learner performance data. DoD Instruction 1322.26 recommends the Experience Application Programming Interface (xAPI) data specification as the contemporary method for managing learner-performance data, and while xAPI and SCORM can be implemented together, a more modern approach to content packaging and delivery is warranted.

The cmi5 specification defines a set of rules for how online courses are imported, launched, and tracked using an LMS and xAPI. Technically, cmi5 is an xAPI Profile, which means it inherits all of the characteristics mandated by the xAPI specification, but cmi5 also imposes additional requirements. These include interoperability rules for content launch, authentication, session management, reporting, and course structuring. The cmi5 specification also enables the packaging and delivery of distributed learning resources that sit outside of a web-browser (e.g., mobile apps, offline content). The cmi5 specification could play an important role in DoD's modernization, facilitating progress from SCORM-based LMS-centric courseware to a distributed learning "ecosystem" that delivers different learning opportunities across a range of federated platforms. However, DoD has not yet acquired cmi5-based content because (a) there are a lack of LMSs and authoring tools that support cmi5, and (b) there is no software conformance test suite for validating whether courseware adheres to the cmi5 specification.

Outcomes: This project will design, develop, test, and ultimately deliver a free and open-source **cmi5 content player** that serves as reference implementation for DoD stakeholders. The project will also deliver a **cmi5 Conformance Test Suite** that validates cmi5 content packages against the latest specification.[1]

Summary of Major Objectives	Associated Deliverables
Collect/analyze requirements	Requirements Traceability and Verification Matrix (RTVM)
Author user-centered design documents	Software design documents
Develop cmi5 (a) player and (b) conformance test suite	Content player and test suite source code
Generate cmi5-based content for test/demo	Exemplar cmi5 courses (n≈10)
Test/demonstrate cmi5 courses, player, and test suite	Successful demonstration and functional testing report
Provide transition roadmap for cmi5 content and player	System integration plan
Minimize software vulnerability/support accreditation	System security plan (to support cybersecurity approval)
Provide "how to" documentation for DoD end-users	Administrator, developer, and courseware-author guides

[1] https://aicc.github.io/CMI-5_Spec_Current/