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Reaching out after 5 years

Advanced distributed learning moves beyond developing standards

By Robert A. Wisher

"My challenge as director for ADL is how to focus efforts to increase ADL's impact on readiness in a capabilities-based training environment."

Robert A. Wisher
Director
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The Advanced Distributed Learning initiative recently celebrated its fifth anniversary. Tracing its roots to a kickoff meeting convened by the President's Office of Science and Technology Policy, the initiative commonly known as ADL has grown from a concept into multiple collaboration laboratories and partnerships involving thousands of people worldwide.

It is advancing interoperability standards for online learning and creating the future learning environment. ADL is attracting a following of adopters and users, but its reach extends well beyond the development and promotion of standards. As the Defense Department begins to fundamentally transform training, ADL again is at the forefront, assessing and implementing new technologies for enhancing human performance and improving readiness.

Prior to 1999, numerous organizations drafted a variety of standards and specifications for what is commonly called e-learning. These disparate efforts reflected mutual interest, but lacked a common framework. In January 1999, Executive Order 13111 tasked the Defense Department to take the lead in working with other federal agencies and the private sector to develop common specifications and standards for technology-based learning. Shortly after, the initial draft version of the sharable content object reference model (SCORM) interoperability standard was developed to integrate and connect the work of the various organizations.

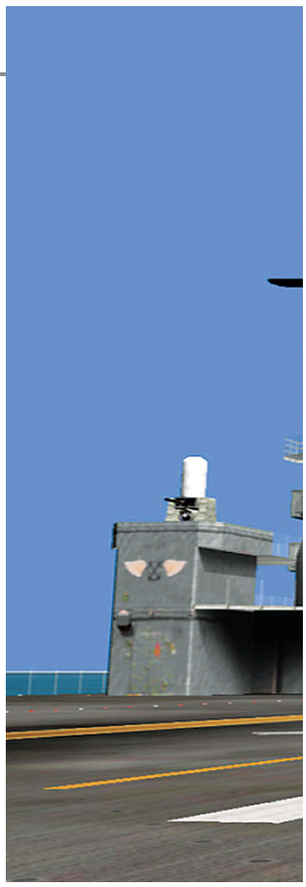
The SCORM defines a Web-based learning content aggregation model and a runtime environment for learning objects. It incorporated many of the emerging specifications into one common model. The Defense Department's motivation guiding the ADL initiative was altruistic: A common global framework for distributed learning goods and services creates a robust marketplace for vendors; the department and other learning organizations benefit by procuring systems and tools at a marginal cost and by exchanging learning content.

To accomplish this goal on a large scale, cooperative and collaborative efforts were needed, along with a reciprocal sharing of test programs, dissemination methods, strategies and lessons learned.

ADL CERTIFICATION AND PLUGFESTS

ADL initiated the development of test software to validate conformance with the SCORM in 1999. We have recently launched a formal ADL certification program. The program now is supported by authorized Certification Testing Centers that independently assess content and learning management systems for conformance with the SCORM. The process is described on the ADL Web site, *http://www.ADLnet.org*.

The release of ADL information occurs through an active Web site and through a hands-on, collaborative venue called a Plugfest. These informal events bring together system vendors, content developers and tool creators for no-fault interoperability testing.



TRAINING TRANSFORMATION

The ADL initiative has been on a steady course, with success stories highlighted in the General Accounting Office's recent report, "Military Transformation: Progress and Challenges for DoD's Advanced Distributed Learning Programs." The report also identified challenges facing the program, such as an organizational culture resistant to change.

As part of the larger framework known as training transformation, ADL is in a position to work through this resistance. Through an advancement of the SCORM model, through engaging prototypes and through an extension to new performance-enhancing technologies, ADL is critical in achieving the broad goals of training transformation.

My challenge as director for ADL is how to focus efforts to increase ADL's impact on readiness in a capabilities-based training environment.

ADL TECHNOLOGY INTEGRATION

Implementation plans for training transformation currently are being developed. From my perspective, the first order is to raise the SCORM to new heights and reassess its suitability to integrate with other technologies, such as simulations and job-performance aids. With the release of SCORM Version 1.3 later this year, the model will be at a point comparable to the learning outcomes achieved by "traditional, stand-alone" computer-based training, with the massive advantages of interoperability and Internet access.

But we need to push the envelope further. For example, intelligent tutoring systems produce notably higher learning outcomes than traditional computer-based training — about a full standard deviation as opposed to a 0.4-standard deviation improvement when compared to classroom instruction.

For a variety of reasons, intelligent tutoring systems remain costly. Future versions of the SCORM must aim towards incorporating these advances on a large, affordable scale. We will need the assistance of our partners in the specification and standards process because partnerships that build consensus are essential for global acceptance. We clearly need the support of experts from industry and academia to forge an abstract framework from which to develop the specification.

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QUANTUM 3D IMAGE

Leveraging the existing open-architecture standard, called the High-Level Architecture, with the sharable content object reference model, or SCORM, offers unparalleled opportunities for realistic practice combined with performance-based training in flight simulators and other systems.

DIGITAL REPOSITORIES

The uncertain nature of future conflicts creates an uncertainty in requirements of what should be trained up front (the supply side) and what can be trained or job-aided on the spot (the demand side). War fighters must be ready to adapt and learn quickly.

Another common ground for ADL and training transformation is reliable repositories of learning content that can be re-purposed and re-sequenced for the specific needs of a combatant commander. Repositories are simply collections of digital objects. The objects are described by metadata in a consistent and agreed-upon manner. Examples include raw media files, information assets and learning objects in the form of a sharable content object as described by the SCORM.

IMS Global Learning Consortium Inc. recently released its digital-repositories interoperability specification based on established standards by the World Wide Web Consortium. This represents a major milestone in achieving the ADL vision of distributed learning environments — where learning content is accessible anytime, anywhere.

Through a cooperative research-and-development agreement between the Joint ADL Co-Lab in Orlando, Fla., and Learning Objects Network Inc., messaging and integration software components are undergoing a beta test as one method of developing a SCORM-compatible network of distributed repositories.

ADL currently is developing a repository application profile that will enable the creation of interoperable distributed repositories. The IMS and Learning Objects Network's efforts will be evaluated to determine how they can be used in the application profile.

The digital knowledge environment enabled by distributed repositories makes possible interservice, intergovernmental, interagency and multinational training applications. With the advent of wireless tablets and hand-held form factors, the content can be delivered in the form of job performance technology, which will be investigated at the ADL Co-Lab in Alexandria, Va.

ADL AND SIMULATION

Working with the modeling and simulation community, we are determining how their existing open-architecture standard, the High-Level Architecture (HLA), can be integrated with distributed learning. The power of leveraging HLA with the SCORM offers unparalleled opportunities for realistic practice coupled with performance-based training.

The Boeing Co. recently reported a case illustrating communication between the SCORM and HLA. In the context of training for an instrumented carrier landing, a learning-management system launched a sharable content object that presents the objectives and initial conditions for the simulation exercise. The sharable content object sends an HLA packet to initialize the simulation and subscribes to the simulation's HLA packets. The student then performs the simulation task, in this case performing a landing at a given altitude, speed, distance, etc.

During the task, the simulation sends information about the aircraft status and data about student performance to the sharable content object. The object contains the logic and parameters to evaluate student actions. It displays performance feedback to the student and returns performance data to the learning-management system. Upon completing the task, score summaries, completion status and mastery status are available. By adding content sequencing now to the SCORM, prescriptions in terms of additional training to remedy ineffectual performance are within reach. This is one example of how ADL can enable current and new technologies to enhance performance. ■

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