ADVANCED DISTRIBUTED LEARNING CO-LABORATORY NETWORK

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Abstract

The Advanced Distributed Learning Initiative (ADL) was launched in November 1997 by the Secretary of Defense. The ADL Initiative will allow for high quality learning available anytime, anywhere, tailored to individual needs. It will enable global access and reuse of learning tools and content through the iterative development of industry supported guidelines and specifications. A key component of the ADL Initiative is collaboration. Collaboration is necessary for the establishment of common specifications and for the sharing of tools and learning content. It will also enable achievement of cost-savings by re-use, thus avoiding duplication of many instructional objects.

The rapid pace of technological change, combined with limited DoD investments in learning technology research, suggests a need to reinvent how the Department conducts and implements research and development activities. The ADL Co-Laboratory network was initiated by the Office of the Secretary of Defense (OSD) Readiness & Training Office in 1999 and has subsequently become an important resource for the military services and the joint community. The ADL Co-Lab hub is located in Alexandria, Virginia and focuses on policy-level issues, development of common tools and specifications, development of compliance testing software, interagency coordination, and advanced research. The ADL interservice node was established in Orlando to promote collaboration in ADL systems development, prototyping, and acquisition across the Department of Defense. An Academic ADL Co-Lab node was also established at the University of Wisconsin as a first step in leveraging the tremendous knowledge resources available in the nation's universities and community colleges.

This paper will provide an overview of the ADL Co-Laboratory network, including a description of its objectives and structure. This paper will also provide information on the current and future initiatives, including information on the ADL prototypes and status of the development of common specifications.

Biographical Sketch:

Janet Weisenford is the Director of the JOINT ADL Co-Laboratory located in Orlando, Florida. The JOINT ADL Co-Laboratory is comprised of members from the Office of the Secretary of Defense Readiness and Training Office, the four military services, and the Coast Guard. The purpose of the JOINT ADL Co-Lab is to assist in the development, prototyping, and implementation of Advanced Distributed Learning within the military services.

Paul Jesukiewicz is the Director of the Advanced Distributed Learning Co-Laboratory at the Institute for Defense Analysis (IDA). The ADL Co-Laboratory supports the Advanced Distributed Learning Initiative of the Office of the Secretary of Defense and White House Office of Science and Technology. The hub serves as the umbrella organization supporting the overarching mission needs of the OSD and other federal agencies, as well as specialty organizations that rely on distributed learning. As the hub of the ADL activities, it focuses on policy, management, an accountability of ADL processes, infrastructures, and assessment of compliance to the ADL guidelines and specifications.

Judy Brown is the Director of the Academic ADL Co-Laboratory which is located at the University of Wisconsin, Madison, Wisconsin. This node of the ADL Co-Laboratory Network is responsible for application of ADL to higher education, and is actively seeking participants from educational organizations.

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BACKGROUND

The Advanced Distributed Learning Co-Laboratory Network was created to support the Advanced Distributed Learning (ADL) Initiative. The vision and goal for the ADL initiative, as expressed by Secretary of Defense William Cohen in his 30 Apr 99 DoD ADL Strategic Report to Congress, is to "Provide access to the highest quality education and training, that can be tailored to individual needs and delivered cost effectively, anywhere and anytime it is required." (Cohen, 1999). Implementing this vision requires collaboration within the Department of Defense and the Federal Government at large as well as collaboration with industry, academia and state and local entities. Implementation also requires a fundamental change in culture and abandonment of practices that reinforce stand alone, non-interoperable training systems. (See Table 1 which highlights the features of the current learning environment and how they will change in the ADL environment). In order to move from the Secretary of Defense's vision to practice, common guidelines and standards are needed. These common guidelines and standards require input and buy-in from the government, private industry, and academia which again requires broad collaboration. The initial standards will provide the ability for allowing the exchange and reuse of content across different Learning Management Systems (LMSs). They will also provide the capability for different LMSs to access content from learning repositories and for data on learner performance to be shared between different LMSs. They will also provide the capability to move a course from one LMS to another. The Advanced Distributed Learning Co-Laboratory network provides an environment in which collaboration can occur. Through the Co-Laboratory network, content and tools can be shared and common guidelines and standards can be developed, tested and implemented.

The Changing Learning Environment	
Past	**Future**
• Independent Content Development by Services	• Co-develop and reuse content
• Contract with military supplier	• Partner with commercial firm
• Centralized Control	• Decentralized development
• Separate Training, performance support and technical manuals processes	• Integrated Learning, Performance support and technical data; reuse
• Learning as an independent event that removes the operator from operations	• Continuous learning; anytime, anywhere
• Stable knowledge base	• Dynamic knowledge base; increased velocity for learning
• Systems are not interoperable	• Commercial standards provide a basis for interoperability, reusability, durability, adaptability, and affordability

Table 1. Past and Future Elements in The Changing Learning Environment

ADL CO-LABORATORY NETWORK OVERVIEW

The ADL Co-Laboratory Network is comprised of independently supported entities (a hub and functionally defined nodes) which have the following characteristics:

- a hub called the ADL Co-Laboratory is the operational command post of the ADL initiative. It is jointly operated by the Institute for Defense Analyses (IDA) and Concurrent Technologies Corporation (CTC), and is located in Alexandria, Virginia;

- a node is a functional entity that serves a domain or area of operational responsibility. There are two nodes:

1. The JOINT ADL Co-Laboratory, located in Orlando, Florida, has responsibility for the Military Services and other military oriented operational units such as the Coast Guard, and

2. The Academic Co-Laboratory, located in Madison, Wisconsin, has the functional responsibility to be the ADL focal point for the Nation's universities and colleges.

The ADL Co-Laboratory hub focuses on policy level issues, development of guidelines and specifications, development of policies and procedures for testing compliance with ADL specifications, and advanced research. As of July 2000, the sponsors of the ADL Co-Laboratory hub include the Office of the Secretary of Defense, the Department of Labor, and the National Guard Bureau.

The JOINT ADL Co-Laboratory node in Orlando is responsible for implementation, support of the Service training acquisition processes, and the sponsorship of ADL prototypes. It was established on November 1, 1999 when a Memorandum of Agreement was signed by the Director, Readiness and Training, Policy Programs in the Office of the Secretary of Defense with the Commanding Officer, Naval Air Warfare Center Training Systems Division, the Army Simulation, Training and Instrumentation Command, the Air Force Agency for Modeling and Simulation, the Air Force Advanced Distributed Learning Institute, the Army Research Institute, the Marine Corps Program Office, and the U.S. Coast Guard Liaison Office. Additional organizations expressing interest in participating in the JOINT ADL Co-Laboratory are the Chief of Naval Education and Training and the U.S. Army Combined Arms Support Command. Government operational entities can become members of the JOINT ADL Co-Laboratory by signing the Memorandum of Agreement (MOA) and committing to share their ADL efforts and resources. Collaboration with industry and academia occurs through agreements with a Service or operational unit and with the JOINT ADL Co-Laboratory.

The JOINT ADL Co-Laboratory is staffed by personnel from the Services who possess skills in a variety of disciplines such as psychology, engineering, computer science, instructional systems design, and management. The JOINT ADL Co-Laboratory is located in the University of Central Florida's Institute for Simulation and Training.

The Academic Co-Laboratory is located at the Pyle Center in Madison, Wisconsin and is responsible for application of ADL to higher education. It was established on January 10, 2000 when a Memorandum of Agreement was signed by the Director, Readiness and Training, Policy Programs in the Office of the Secretary of Defense with the Director, ADL Co-Laboratory in Alexandria, Virginia, the University of Wisconsin, and the Wisconsin Technical College System This Co-Laboratory is actively seeking participants from educational organizations and performs the following functions:

- research and development of advanced learning technologies;
- assess ADL compliant tools to determine if and how much they will enhance teaching and learning in universities and colleges;
- compliance testing for learning objects;
- research and evaluation of intelligent tutors with an emphasis on determining Science and Technology needs yet to be met;
- application and evaluation of assessment tools in the context of college and university curriculums; and
- Learning Management System evaluation and assessment process which will meet the specific needs of the universities and colleges system.

At present, there are no additional nodes planned for the ADL Co-Laboratory Network. Rather, the emphasis is on building the capabilities and collaborative relationships of the existing ADL Co-Laboratories.

ADL Co-Laboratory Network Functions

The primary functions of the ADL Co-Laboratory System include:

- developing guidelines, specifications and standards for ADL;
- compliance Testing for ADL including developing policies and procedures for the institutionalization of testing;
- dvaluating ADL content, learning management systems, repositories, and authoring tools;
- demonstrating ADL content, learning management systems, repositories and authoring tools;
- disseminating information on ADL and providing training and consulting services to support the implementation of ADL;
- conducting research; and
- sponsoring ADL Prototypes.

Each of these functions will be discussed in greater detail in the sections that follow.

Developing Guidelines, Specifications and Standards for ADL

The ADL Co-Laboratory serves as a focal point for Department of Defense and Federal Government participation in the development of standards for Advanced Distributed Learning. There are three standards bodies engaged in developing standards for Advanced Distributed Learning. They are Instructional Management System Global Learning Consortium (IMS); the Aviation Industry Computer-Based Training Committee (AICC); and the Institute of Electrical and Electronics Engineers, Inc. (IEEE). The ADL Co-Laboratory is working with each of these bodies and published the Sharable Courseware Object Reference Model (SCORM) on 31 January 2000. The SCORM draws upon the work of each of the standards bodies and offers a specification for ADL. This specification includes a course structure format, a runtime environment (which consists of a launch protocol, an application program interface, and data models) and meta data used to describe course, content and media for learning. The SCORM can be downloaded at www.adlnet.org along with additional information on the SCORM.

Compliance Testing for ADL

In addition to publishing a specification for ADL, the ADL Co-Laboratory developed processes for assessing and determining compliance with the SCORM. These processes include:

- the development of software for use by anyone in testing compliance with the SCORM;
- hosting Plugfests in which vendors and developers could test their products and demonstrate interoperability across learning management systems; and
- developing procedures for testing and certification of compliance with the SCORM.

Beta compliance testing software was developed and made available for use in the plugfests and will be available from the ADL web site (www.adlnet.org). It is important to note the compliance testing software in no way implies certification of any products by ADL or any other involved company or organization. Steps are currently underway to determine an official process for ADL SCORM certification testing.

The first Plugfest was held June 19-23, 2000 at the ADL Co-Laboratory hub in Alexandria, Virginia. The Plugfests are intended to facilitate and accelerate early implementations of the SCORM. Two hundred and fifty individuals representing 100 companies and organizations participated in the first Plugfest. A beta version of the testing software was used to evaluate content and learning management systems in terms of their compliance with the SCORM. Interoperability between learning management systems and content created by different developers using a variety of authoring tools was demonstrated at this event. This was a first step toward achieving the baseline capability for an ADL environment in which content could be developed and shared across different learning management systems.

The focus of the second Plugfest hosted by the Academic Co-Laboratory in August 2000 was to educate leaders and practitioners in higher education regarding Advanced Distributed Learning (ADL) and Shareable Courseware Object Reference Model (SCORM), continue momentum gained at Plugfest #1, and to concentrate on content. Whereas the culmination of the first Plugfest was an interoperability demonstration, the second Plugfest extended this demonstration and included additional content.

At the third Plugfest, which is being held concurrent with the Interservice/Industry, Training, Simulation and Education Conference, participants will also demonstrate compliance with the SCORM. Moreover, content will be created at the conference and will be used with existing content to build courses thereby demonstrating reuse. A number of Learning Management Systems and portals will be used to host and track the content.

Plans and procedures for establishing a permanent, independent capability for testing and certifying tools and learning management systems compliance with the ADL standards are being developed. Currently, it is envisioned that a separate entity outside of the ADL Co-Laboratory network will be established to oversee and conduct the testing process.

Evaluating ADL content, learning management systems, repositories, and authoring tools

Through a partnership with the Chief of Naval Education and Training (CNET), the JOINT ADL Co-Laboratory and CNET are working with the University of Central Florida and the Florida State University to assemble guidelines for developing and evaluating web based instruction. These guidelines will also be used to evaluate web-based learning environments.

Another function that the JOINT ADL Co-Laboratory is undertaking is the benchmarking of the use of ADL in government, academia, and industry. This benchmarking effort will identify best practices being used to implement ADL. As part of this effort, the Co-Lab is obtaining examples of content, learning management systems, portals and content repositories.

Demonstrating ADL content, learning management systems, repositories and authoring tools

In addition to performing testing of the SCORM, the Plugfests serve as open forums for demonstrating achievement of several of the functional requirements of ADL including:

- accessibility
- interoperability
- durability
- reusability
- adaptability
- affordability

Accessibility refers to the ability to access content anytime, anywhere. This is achieved through the use of internet based technologies and portable personal computers. Interoperability is demonstrated when one user can use content developed by another and operate it on an independent learning management system. Durability refers to the ability for the content to be upgraded to accommodate advances in computing technology. Reusability is when content developed for one purpose can be reused for another purpose. Adaptability embodies the tailoring of content to the individual learner and the learning requirement. Affordability is achieved through the creation of repositories of content that can be used for a multitude of applications by an almost infinite number of users. Each of these functional requirements is being demonstrated, evaluated and extended by the work of the ADL Co-Laboratory Network. Indeed, at the first Plugfest, examples of intelligent tutoring capabilities that provide for adaptability were demonstrated in addition to interoperability and reusability.

The ADL Co-Laboratory hub and the nodes provide numerous demonstrations of ADL content, tools, learning management systems, repositories, portals, and delivery systems to personnel interested in applying ADL to address their learning needs. Prior to the establishment of the ADL Co-Laboratory Network, individuals interested in learning about ADL had to seek out demonstrations. With the dynamic environment of e-learning, a focal point for government demonstration and evaluation of ADL systems was needed. The ADL Co-Laboratory Network provides an environment in which developers can supply their tools and content for demonstration to a broad audience. The technical staff can answer questions and offer insight into which products are available to address different learning requirements.

Disseminating information on ADL and providing training and consulting services to support the implementation of ADL

The ADL Co-Laboratory Network maintains an active communication network and disseminates information through a number of methods. One method for communication is via the internet. The ADL Co-Laboratory has an active website, www.adlnet.org, which provides:

- basic information on ADL;
- technical forums;
- the SCORM and updates;
- testing software;
- access to a learning repository;
- announcements on ADL events including the call for prototypes;
- answers to questions concerning ADL; and
- a focal point for information on ADL and the Co-Laboratory initiatives.

In addition to the web site, the ADL Co-Laboratory hub and its nodes conduct tutorials on topics relevant to ADL. They also host individual sessions on the use of the SCORM. The JOINT ADL Co-Laboratory conducts monthly forums in which information on ADL is shared with representatives from the Services. Staff of the ADL Co-Laboratory Network participate in numerous conferences and meetings

including the Distributed Learning Symposium, the Navy ADL Stakeholder meetings, the Joint Service Advisory Group Meetings, Federal Training Technology Initiative meetings, NATO and Partnership for Peace working groups and other forums. The purpose of this participation is to share information and to provide updates on ADL and to provide organizations the opportunity to work with the ADL Co-Laboratory Network. The ADL Co-Laboratory Network is also developing training materials on ADL and the SCORM to promote understanding and application of ADL.

Conducting research

The ADL Co-Laboratory Network contributes to the ADL research agenda by identifying areas in which research is needed. This is accomplished through the interaction with both the users and developers of current ADL technology. Gaps in existing capabilities highlight areas in which research is needed.

Additionally, the ADL Co-Laboratory Network provides a forum, through its testbeds and commitment to collaboration, where the multitude of research in learning technologies can be tested, evaluated, and disseminated. The communication network operated by the ADL Co-Laboratory Network serves as a resource for sharing research efforts across the government, academia, and private industry.

The ADL Co-Laboratory Network, as identified in the Department of Defense's Implementation plan, "will help determine how learning technologies can be designed to bring about specific, targeted instructional outcomes reliably, within as wide a range of instructional settings as possible." (Department of Defense, May, 2000). The ADL Co-Laboratory Network, with its diverse participants spanning government and academia is ideally situated for such a task. It will accomplish this through partnerships with those organizations conducting the research. Areas identified for focus in the Department of Defense Implementation Plan include:

- tailoring instruction to the individual learner in terms of pace, content, and sequence;
- organizational changes required to implement ADL;
- enhanced instructional techniques including intelligent tutoring;
- cost-effectiveness analysis of ADL; and
- methods for measuring and verifying the capabilities and performance of learners.

In addition to supporting the research in these areas, the ADL Co-Laboratory Network will also serve as a catalyst for transitioning the results of the research to use and integration of the technology into commercial products. One method for transition of research is through the sponsorship of ADL prototypes.

Sponsoring ADL Prototypes

In February 2000, the JOINT ADL Co-Laboratory node released a call for the development of ADL prototypes to military organizations. The focus of this call was to encourage the development of prototypes using the newly released SCORM version 1.0. Funds were made available to organizations who submitted proposals that met the following criteria:

- use the SCORM;
- demonstrate the functional requirements of ADL(accessibility; interoperability; durability; reusability; adaptability; and affordability);
- show application across the Services; and
- leverage resources through collaboration

Thirty proposals were received in response to the call for prototypes. (See Table 2)

Additional information on the proposals submitted is available on www.adlnet.org along with more detailed descriptions and briefing materials on those selected. All of the proposals received were of high quality so the selection process was difficult. Members from the ADL Co-Laboratory hub evaluated the proposals along with staff from the University of Central Florida's Institute for Simulation and Training. This approach was taken to provide an independent technical review of the proposals. A kick-off meeting for the selected proposals was held in May, 2000. Members of the JOINT ADL Co-Laboratory staff are working with each of the prototypes. In addition to these prototypes, the Joint ADL Co-Laboratory has six rapid prototypes.

These prototypes are:

- Modeling and Simulation Overview
- Depot Maintenance
- Smart Cruiser
- Armor Captain's Career Course
- Introductory Civilian Supervisor Training
- EA-6B Training

These prototypes were developed with the initial members of the JOINT ADL Co-Laboratory in response to direction to develop rapid demonstrations of ADL. Descriptions of the prototypes are available on www.adlnet.org.

Proposal Title	Funded
SIPRNET Interactive Learning and Knowledge Management System for Secure Interactive Distributive Learning	No
Reusable Raw Media Object Database and Interservice Interface	No
Advanced Distributed Learning for the Damage Control Repair Party	Yes
Prototype Conversion of JOINT SOF Education to Computer Based Training to ADL Compliant Courseware	Yes
Joint Planning Course	Yes
Development & Establishment of Guidelines & Standards for Reuse of Instructional Components	No
Reducing the Operational Impact of Low to Medium Energy Laser Threats Through ADL	No
Develop A Prototype for AV-8B Depot Maintenance Utilizing SCORM Guidelines	Yes
Joint Harrier Engine Repair Maintenance Performance Improvement	Combined
Learning Management System for the "SMART" Center: A Web-Based Virtual Learning Center for Maintenance Resource Management Training	Yes
Rules Based Access Control of Distributed Resources Using Smart Cards, Biometric Identification Tools, and/or PKI for ADL	No
Cross Platform Interoperability for Maintenance Mentoring System	Combined
Collaborative Learning Prototype: A Study of Interoperability Across Learning Management Systems	No
Air Force Modeling and Simulation Education ADL Model Program	Yes
Advanced Distributed Learning-Medical	No
U.S. Navy Surface Warfare Officer ADL Management Instruction	No
Information Awareness Horizons	No
Interactive Training for Tactical Decision Making	No
A Network-Based ADL Implementation of the SCORM for Electrical and Computer Engineering	No
Financial Management ADL Model	Yes
ADL Model Repository	Yes
Advanced Distributed Learning for Super High Frequency Network Administration	No
Joint Doctrine Operations Library	Yes
Computer-Based Team Dimensional Training	No
Scenario-Based Shipboard Training & Assessment Development Module for Instructors	No
Joint Services Advanced Distributed Learning Instructor Training Initiative	Yes
Army Information Warehouse Distance Learning Initiative	No
Historical Support Online and On Demand	No
Training to Combat Spatial Disorientation	No

Table 2 Proposals for ADL Prototypes

A number of the ADL prototypes participated successfully in the first Plugfest. Those prototypes that were tested at the Plugfest were the Modeling and Simulation Overview, the Depot Maintenance, the SMART Center, the Joint Services Advanced Distributed Learning Instructor Training Initiative, and the ADL Model Repository.

A solicitation for additional prototypes for FY 01 will be conducted. Areas of emphasis for this solicitation include intelligent systems; reuse of content across training, performance support, and technical manuals, and the use of gaming and entertainment technology.

Although still in its early stages, the prototype effort has been successful in encouraging the use of ADL to address training and performance requirements across the Department of Defense. By providing incentive funds, the ADL Co-Laboratory has been able to reduce the risk incurred in implementing the new specifications and for adopting novel approaches to learning. Moreover, the solicitation fostered the development of applications across the services and promoted the reuse of content. It also strengthened collaboration within the Department of Defense, with industry, and with academia.

ADL CO-LABORATORY NETWORK COLLABORATIVE EFFORTS

The very nature of the ADL Co-Laboratory Network is collaboration and, indeed, much of what has been described thus far has highlighted the partnerships necessary to achieve the 21st Century Learning Environment of ADL. This section will provide a description of collaborative efforts that extend beyond the Department of Defense and the standards efforts.

Collaboration With the Department of Labor

The Department of the Labor is a contributing sponsor of the ADL Co-Laboratory. The Department of Labor is providing the Federal Learning eXchange and the Federal Learning Technology Resource Center to the ADL Co-Laboratory Network. The Federal Learning eXchange identifies training and education opportunities for Federal employees. The Federal Learning Technology Resource Center will promote the use of learning technology to address federal training requirements and encourage the development of web-based instruction. It is anticipated that other Federal Agencies will also work with the ADL Co-Laboratory Network to further coordinate initiatives for addressing the training of the Federal workforce.

Collaboration With NATO and Partnership for Peace Countries

The ADL Co-Laboratory Network is working with the NATO/Partnership for Peace Working Group on Individual Training and Education to share information on ADL initiatives. The NATO Working Group established a subgroup on ADL. Representatives from the ADL Co-Laboratory Network participate in this forum. Information on ADL from member countries is exchanged. A survey of ADL initiatives of participant countries is being conducted to identify requirements and programs currently underway. The goal of this effort is to identify areas in which collaboration can occur. Projects under consideration include hosting a European Plugfest and sponsoring the development of prototypes.

Additionally, the ADL Co-Laboratory Network has hosted a number of officials from various countries to exchange information. Plans are being made for representatives from some of these countries to provide visiting technical representatives.

Collaboration With Industry

The ADL Co-Laboratory Network is working with industry and plans to expand the number of industry partnerships. Through an agreement with the Navy, the JOINT ADL Co-Laboratory is working with click2learn.com. Click2learn.com and its industry partner, Sonalysts, developed an adaptive learning authoring tool for ADL that is being used to develop some content for the EA6-B community as one of the JOINT ADL Co-Laboratory rapid prototypes. Additionally, click2learn.com is providing a learning portal as a testbed for the JOINT ADL Co-Laboratory.

Other agreements include a cooperative research and development agreement with Aera Corporation to share examples of on-line learning in the JOINT ADL Co-Laboratory. Additional agreements with industry are anticipated as the lab is populated with examples of content, authoring tools, portals, and Learning Management Systems.

FUTURE INITIATIVES OF THE ADL CO-LABORATORY NETWORK

The ADL Co-Laboratory Network began initial operations in December, 1999. Significant events of its first year of operation include:

- the release of the SCORM;
- the three Plugfests at which ADL specifications were tested and interoperability, adaptability, and reusability were demonstrated; and
- the ADL prototypes.

During the next year, the ADL Co-Laboratory Network will continue to expand its partnerships within the Department of Defense, throughout the government, with academia, with industry, and internationally. The ADL Standards development will remain a critical function for the Co-Laboratory Network Support for implementation of these standards will be provided to vendors who are creating tools for ADL and to organizations who are developing ADL systems. Policies and processes for testing compliance with the standards will be developed.

The ADL Co-Laboratory will also continue to sponsor prototypes, especially in the areas of intelligent systems; the reuse of content across training, performance aiding, and technical data; and the use of gaming and entertainment technologies for learning. Efforts to populate the ADL Co-Laboratories with content, portals, repositories,

LMSs and authoring tools will be expanded to support the role of the ADL Co-Laboratory network as both a demonstration site and a testbed.

Initial results should be available within the next year in the area of collaboration. Whereas the ability to share content has been demonstrated technically through the Plugfests, adoption of business practices and organizational commitment to share content are at an embryonic stage of development and must be nurtured. The ADL prototypes are providing opportunities for organizations to work together and reuse content on a small scale. The prototypes will provide models for how content can be developed cooperatively and be reused by different organizations. However, until the collaborative approach is adopted as a key component of an organization's strategy for implementing ADL, the full potential of ADL will not be achieved. In the upcoming year, the ADL Co-Laboratory Network will work toward building the foundation for these new business practices based on collaboration. This work will include facilitating co-development initiatives between the military and academia and between government and industry. Shared repositories where content can be accessed to address different learning requirements will be developed. Through such initiatives, the Advanced Distributed Learning Co-Laboratory Network will make the concept of collaboration a reality and thereby create the 21st Century Learning Environment.