e-Learning standards are here! Are you ready?

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Agenda
- Standards
- Background
- SCORM
- Status
- Future
- Take Away

Standards Make Things Work
- Railroad tracks
- Light bulbs
- Power outlets
- Beer bottle caps
- Phone lines
- The Internet

…we take them for granted

Standards and Specifications

Standard
- de jure Standard: De jure \(\text{\`D\e\xe9} \text{ju`re}\) [L.] By right; of right; by law; – often opposed to “de facto.” The designation/certification of a specification’s status by an accredited body such as IEEE LTSC, ISO/IEC–JTC1/SC36, or CEN/ISSS (European).
- de facto Standard: de facto adj: existing in fact whether with lawful authority or not. Typically, when a critical mass or majority choose to adopt and use a specification. For example, TCP/IP, HTTP, VHS etc., are all “de facto” standards.

Source: S3, Masie Center
Specification

A specification is a documented description. Some "specs" become a standard, which means they have received the stamp of accreditation after having proceeded through the four stages outlined below. In some industries, something cannot be sold until it receives a stamp of approval by the government (i.e., electrical devices are accredited by IEEE).

Source: S3, Masie Center

Why We Need Common Specifications

Surprising as it seems, before June 2000 we couldn’t . . .

- Move a course from one web-based Learning Management System (LMS / CMS / LCMS) to another.
- Run or reuse course content across different systems (multiple proprietary vendor tools).
- Create searchable learning content or media repositories across different environments (Servers).

Source: IMS

The Sea Change in e-Learning

Everyone

Open Standards

Emerged

Users

Pioneers

0

Individual

Shared

Infrastructure

Source: IMS

Background

Magnitude of Education and Training in DoD

- Addresses the needs of 2.5 million military personnel, DoD civilians, and their dependents
- Includes approximately 30,000 military training courses
- Costs about $15 billion annually to operate and maintain military schools
- Involves career-long learning: recruit, basic, advanced, and professional development
- Encompasses a broad range of technical and decision making skills for both individuals and teams

Source: Guzy, 1994

DoD’s Extensive Experience with Learning Technology

- Pioneered the use of flight simulators – 1940s
- Introduced standard procedures for instructional system design – 1970s
- Introduced use of self-paced Computer Based Instruction – 1970s and 1980s
- Developed Internet predecessor
- Pioneered the use of Distributed Interactive Simulation – 1980s
- Introduced standards for reuse and interoperability of simulation objects – 1990s

Source: IMS
ADL Strategy

- Exploit existing network-based technologies
- Create platform-neutral, reusable courseware and content to lower costs
- Promote widespread collaboration to satisfy common needs
- Enhance performance with emerging and next-generation learning technologies
- Develop common specifications and standards that drives COTS product cycle
- Provide incentives for organizational and cultural change

ADL Functional Requirements

- **Accessibility**: access instructional components from one remote location and deliver them to many other locations
- **Interoperability**: use instructional components developed in one location, with one set of tools or platform, in another location, with a different set of tools or platform
- **Adaptability**: tailor instruction to individual and situational needs
- **Reusability**: incorporate instructional components into multiple applications
- **Durability**: operate instructional components when base technology changes, without redesign or recoding
- **Affordability**: increase learning effectiveness significantly while reducing time and costs

The ADL Vision

- Provide access to the highest quality education and training, tailored to individual needs, delivered cost effectively, anywhere and anytime.

Federal Leadership in Learning Technology Includes . . .

- **Presidential Executive Memorandum** citing ADL as a model for federal agencies to follow (January 98)
- **Presidential Executive Order 13111** tasking DoD to lead collaborative standards development (January 99)
- **Presidential Executive Order “21st Century Workforce Initiative”** reaffirming and expanding learning technology guidance in EO 13111 (June 01)

Landscape

Interoperability?

How do you move content from one course management software platform to another?
Sharable Content Object Reference Model

For reuse of component pieces to be possible, they must be built to a common “object” model.

Components that share a common model can be reassembled and reused.

Learning Objects

“A learning object can be compared to a LEGO™ which can always be snapped together with any other piece because of their uniformly shaped pins. In the world of learning content, we start to see the opportunities that would result if we were able to have the same standards and capabilities to reuse and assemble or disassemble content drawn from any source at any time.”

—Wayne Hodgins

Reusable Learning Object

The SCORM: What is it really?

- Integration of industry specifications from many other organizations (AICC, IMS, IEEE, ARIADNE, etc.)
- Provides a unified learning content model
- Defines a standardized web “run time” environment
- Is the first step on the path to defining a true learning architecture
AICC + IEEE + IMS + ADL = SCORM
Many, Many Long Technical Meetings

IEEE Meetings 1999
Partial list of participants:
Microsoft
Sun
Oracle
Cisco
IBM

IMS Meetings Early 2000
Click2Learn, Avilar, Pathlore, Saba, NETg, SmartForce, and many more...

Two Major Parts of SCORM

1. Content Aggregation
   - How to put content together, move it, and find it

2. Run-time Environment
   - How to run content and track the learner

Tracking The Learner

Learning Management System

Information
- set score
- set time
- set name
- get last lesson location

Learner

Content

SCORM

BOOK 1: The SCORM Overview

BOOK 2: The SCORM Content Aggregation Model

BOOK 3: The SCORM Run Time Environment

SCORM AICC Content Aggregation Model

A Model for Standards Evolution

AICC IMS ARIADNE ADL IEEE ISO

Technical Specifications
Reference Models
Approved Standards

Spec Consortia
Technical Specifications
"Applications Profiles"

Spec Consortia
Technical Specifications
"Applications Profiles"

R&D Concepts
Spec Consortia
Technical Specifications
"Applications Profiles"

Labs, Testbeds, Markets

Standards Bodies
Approved Standards

Technical Specifications
Reference Models
Approved Standards

Labs, Testbeds, Markets

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Labs, Testbeds, Markets

Standards Bodies
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Reference Models
Approved Standards

Labs, Testbeds, Markets

ADL – Convergence of Interests


ARIADNE IMS IEEE AICC ALC use

Class
Microsoft
Macromedia
Oracle
NETg
Cisco
Saba
Pathlore

(Many others)...

ADL SCORM 1.3
Content Model
Run-time Environment

ADL SCORM 1.2
Post Test Phase
Clean, Fix, Trim

Meta Data

ADL SCORM 0.7.3

Launch, Communicate API (From AICC)
ADL Plugfest #1 June 2000

"Agreement to Agree"
ADL – Philip Dodds
IMS – Ed Walker
AICC – Jack Hyde
IEEE – Wayne Hodgins

June 2000

Plugfest Activity
- Attendees 255 to 380 for PF4 to PF5
- Tools 6 to 23
- LMS 18 to 30
- Content 24 to 50

The Missing SCORM piece

Where we are
- SCORM 1.1
- SCORM 1.2 (Add Packaging)
- SCORM 1.3 (?)

Sequencing & Navigation

The missing near-term piece

Where we really want to be
- SCORM 2.0
  - Advanced, Adaptive Architecture

Status
Status Today

- ADL has established relationships with key organizations worldwide.
- A new process for managing the development of technical standards now exists.
- We have an exciting and important vision for the future.
- Pedagogy and content have moved to front and center.

Testing

- Conformance
- (Compliance)
- Certification
- Self test SCORM Version 1.2 Conformance Test Suite Version 1.2.1 (www.adlnet.org)

Four Year Progress Report

<table>
<thead>
<tr>
<th>1998 Conditions</th>
<th>2002 Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>No interoperable eLearning content standards</td>
<td>SCORM 1.2, tested and with conformance test software</td>
</tr>
<tr>
<td>No standards group agreement (AICC, IEEE, IMS, ARIADNE, etc.)</td>
<td>ADL brokered agreement on process and flow among all groups</td>
</tr>
<tr>
<td>No industry consensus</td>
<td>Strong SCORM support by industry (e.g., Plugfest 5)</td>
</tr>
<tr>
<td>Concern and suspicion about ADL initiative and DoD motives</td>
<td>Support for ADL leadership and SCORM process in particular</td>
</tr>
<tr>
<td>No advanced work on next generation architectures</td>
<td>ADL Funded / supported key research at CMU; now harmonizing with MIT OKI work</td>
</tr>
<tr>
<td>ADL’s role unclear to many</td>
<td>ADL viewed as key accelerator/catalyst</td>
</tr>
</tbody>
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Worldwide Network for Learning Technology

A Nationwide Open eLearning Platform in Greater China

International eLearning Standards

- Crucial to long-term success of eLearning in China
- China issued Distance Learning Technology Standards V1.0 in April 2001, based largely on AICC, IMS, IEEE, LON-COM, SCORM
- XML for data communication
- Reusable Learning Objects
- Interchangeable Learner Profiles
- International standards converging to SCORM
- Most International Off-the-shelf Contents and Major LMS are AICC-compliant
Around the World

- SCORM sets e-learning standard
- The architecture of the e-learning environment will closely resemble to the ADL/SCORM environment, enabling a seamless link to the ADL/SCORM standards.

Future

ADL Future Versions of SCORM

How the SCORM Fits

Handheld Instruction

The "A" in ADL

Air Force

Academia

Army

Publishers

Dept of Labor

Global Knowledge

Job Performance

Sharable Content Objects from across the World Wide Web

Assembled in real-time, on-demand

To provide learning and assistance anytime, anywhere

SCORM

Server

IEEE

AICC

ARIADNE

IMS

Scalable Content Models, Resources

SCORM 2.0

New Architecture - highly adaptive - new content models - first integration of performance support & simulation

SCORM 1.3

Sequencing "Ultralite"

SCORM 1.2

Content Packaging Profiles & New Metadata

SCORM 1.1

Clean/Fix

SCORM 1.0

Content Mod. - Run-time Env.

SCORM 3.0


Advanced Capabilities

SCORM 4.0

TBD (Need Research Now for This)

SCORM 2.0

New Architecture - highly adaptive - new content models - first integration of performance support & simulation

SCORM 1.3

Sequencing "Ultralite"

SCORM 1.2

Content Packaging Profiles & New Metadata

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Clean/Fix

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Content Mod. - Run-time Env.

IEEE

AICC

ARIADNE

IMS

Scalable Content Models, Resources

IBM

Macromedia

Czez

NetIQ

Click2Learn

Sales

Pathlore

Centro, (many others...)

Instructional Capability

Technical Specifications

SCORM is necessary, but not sufficient...
Standards Address the Ability to:

- Mix and match content from multiple sources
- Develop interchangeable content that can be assembled, disassembled, and re-used quickly and easily
- Ensure that buyers are not "trapped" by a particular vendor's proprietary learning technology
- Ensure that our learning technology investments are wise and risk adverse
- Increase the effectiveness of learning by enabling greater personalization and targeting of the right content to the right person at the right time
- Improve the efficiency and ROI of learning content development and management
- Increase the quantity and quality of learning content

When Should Content Be Sharable?

- When the content could be reused
- If the content ever needs to move to another LMS environment (a form of reuse)
- If the content might become part of a repository

_Not all content will be reused, but it may well need to be moved!

When Do You Need SCORM?

You do want to be SCORM (1.3) conforming if:
1. You want to design learning content that tracks learner performance and progress and adapts accordingly.
2. You plan to use an L(C)MS to deliver and manage learning content.
3. You are designing content that might be reused in other learning contexts
4. You want to create a library of learning objects

You probably don’t need to be SCORM conforming if:
1. The content is short lived and won’t be reused
2. You never plan to use an L(C)MS to deliver and track content
3. You do not have content that has complex behaviors such as remediation.
4. You want only simple, static, hyperlinked content as reference material

Customer Questions

- "What level of involvement do you have with the various standards activities?"
- "Is anyone from your organization on any of the standards working groups? If so, what have they contributed?"
- "What are your plans for conforming with the accredited standards and the specifications as they emerge? Which specific standards or specifications does your product conform to (i.e., content metadata, content packaging, etc.)?"
- "How can your company assist with our transition strategy if new standards make your existing product obsolete?"

www.academiccolab.org
Thank You!

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Questions / Discussion

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