

The Future of SCORM with S1000D

*(And Why ADL is Transitioning the Stewardship of
SCORM to the Learning, Education, Training
Systems Interoperability (LETSI) Federation)*

X-Pubs

London (*Heathrow Airport, East Runway*), England
June 23, 2008

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Advanced Distributed Learning
Government Co-Chair, S1000D Training Subcommittee

Presentation Coverage:

Projecting the Future by Understanding the Past

Part 1: The Invention of Interoperability

- **The Work of the Aviation Industry CBT Committee**

Part 2: Coordination, Consolidation and Adoption

- **The Work of ADL and the Birth of SCORM**

Part 3: Governance, Evolution and Specialization

- **The Birth of LETSI**

Part 4: LETSI Adaptations – One Future Use Case

- **S1000D and SCORM Harmonization**

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Part 1

The Invention of Interoperability

The Work of the Aviation Industry CBT Committee (AICC)

1988 - 1998

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Original Problem: Audio files central to airline interactive training not interoperable across platforms.

Result: Unsustainable cost burden

Way to a solution: Separate content from platforms

Essential invention: Computer Managed Instruction (CMI)

- The data model – information that get exchanged
- The transport mechanism – to enable content to communicate with LMS.
 - HTTP and ECMA script approaches

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AICC CMI Interoperability Inventions:

**Learner Performance Tracking
(Name, score, bookmarking, etc.)**

File Aggregation

**“Assignable Units”
(Today’s sharable content objects – SCOs)**

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Other AICC Contributions and a Milestone:

- **Conformance Testing**
 - CMI-conformant Content**
 - CMI-conformant LMSs**

- **(The Milestone) AICC submits CMI to Institute for Electrical and Electronics Engineers (IEEE) (Learning Technology Standards Committee) LTSC to be adopted as an accredited standard**
 - A first for an adjunct spec dev group.**

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Part 2

Coordination, Consolidation and Adoption

The Work of Advanced Distributed Learning (ADL)

and the Birth of

The Sharable Content Object Reference Model (SCORM)

1997 - 2005

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AICC Lays a Groundwork for Learning, Education and Training (LET) Standards Development

- **IMS Project (Higher Ed)**
Content Packaging
- **European ARIADNE Project (European Higher Ed)**
Learning Object Metadata (LOM) model
Contributed to IEEE LTSC
- **IEEE LTSC (Standardizing Specs)**
Standardization of the CMI spec.

Groups responding to web-based interoperability

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Advanced Distributed Learning is Born

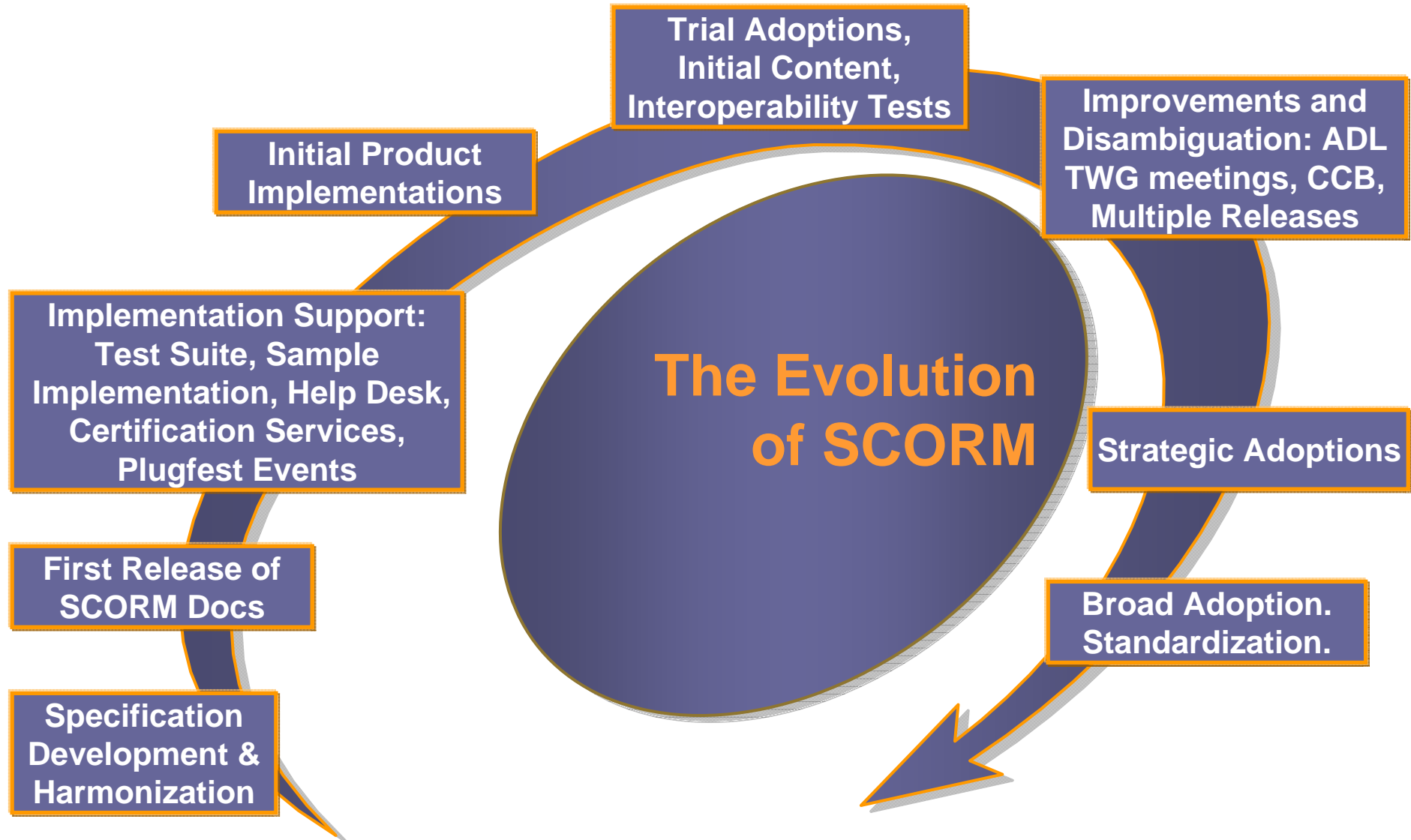
- **Roots in 1997 DoD Quadrennial Review**
Improve learning content distribution
- **White Executive Order 1999 – Science and Technology Office**
Provided executive branch support
- **ADL surveys learning standards landscape**
Many interoperability standards with diverse functions
Specs referenced into single model: SCORM

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Slide 10

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T18



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Part 3

Governance, Evolution and Specialization

The Melbourne Declaration

and

Learning, Education, Training Systems Interoperability (LETSI)

2005 - Present

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The Melbourne Forum

- The ADL's models are now widely adopted in many different contexts and sectors for implementing technology-based learning on a global scale.
- In celebrating this achievement, the Melbourne Forum, *Advancing ADL through Global Collaboration*, endorses the following points as a means of creating and maintaining momentum for the further international advancement, development and deployment of advanced learning technology initiatives:

Slide 12

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The Melbourne Forum Declared...

- **Scalable and sustainable infrastructure is of critical importance in fulfilling the many visions for teaching, learning, education, training and performance support.**
- **Global interoperability based on open standards, is key to achieving scalable and sustainable infrastructure.**
- **An international collaborative approach will optimise the advancement, development and maintenance of this infrastructure.**
- **The current ADL community has provided some of the foundation stones for building this infrastructure.**
- **The continuing involvement of the U.S. *ADL Initiative* will be critical to any collaborative venture.**
- **The formation of a global steward is an effective means to realise the above.**

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The Melbourne Declaration is Born

- An international stewardship organisation shall be established and become fully functional within a three year period.
- The U.S. ADL Initiative in collaboration with the international community will convene, as soon as possible, an Interim Working Group to develop a planning framework and timetable for the creation and commissioning of the proposed international stewardship organisation.

Slide 14

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ADL Initiates the “Learning, Education, Training Systems Interoperability” (LETSI) Federation.

- **LETSI has 12 Founding Sponsors**

Advanced Distributed Learning Initiative, Adobe, Aviation Industry CBT Committee, Booz Allen Hamilton, Fraunhofer IMDT, IEEE Computer Society, IEEE Learning Technology Standards Committee, Instituto Latinoamericano de la Comunicacion Educativa, Korea Institute for Electronic Commerce, Masie Learning Consortium, MedBiquitous, Schools Interoperability Framework Assoc.

- **Operating under IEEE Industry Standards and Technology Organization (ISTO)**
Legal, Finance, Sponsors MOU, Interim Operating Procedures

- **Meetings in London, Toronto, Orlando, Seoul**

- **Technical harmonization efforts: AICC, SIFA, S1000D**

- **Working Groups: Technical, Communications, Business Requirements for SCORM 2.0, Teaching and Learning Requirements**

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The Growth of ADL and SCORM: Going Beyond the DoD Mission

Corporate Training	Chrysler/BBDO	Enterprise-wide learning content management at the SCO level
Professional Training	MedBiquitous	Content interoperability across 65 autonomous healthcare education and training organizations
K-12	Korea Child Home Learning System	A national platform for developing and delivering after-school tutoring (16 technically-autonomous districts)
U.S. DoD	ADL-Registry DoD-I 1322.26	Ambitious plan to enable sharing of all digital training materials across the DoD (procurement policy push)

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Possible SCORM 2.0 Capabilities

- Data Accessibility through the Web
- Assessment, interactions, evaluation
- Collaboration and Community
- Content formats
- Competencies
- Improved search & learning management
- Integrated support for simulations & games
- Quality
- Hooks to support intelligent tutoring applications
- Future-oriented Infrastructure

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Proposed Timeline for SCORM 2.0

May	Open solicitation of white papers – www.letsj.org
August 15	White paper submission deadline
October	3-day technical workshop to discuss best ideas
December	Initial design of SCORM 2.0 produced by Working Groups
Q2 2009	SCORM World Congress

Everything is on the table: software architecture; learning systems architecture; creation, composition, distribution, management and delivery of learning activities; competencies and HR management; team training; repositories, catalogs and search; games and virtual environments; assessment; mobile devices and non-browser clients; intelligent agents; security; permissions and billing; authoritative data resources; collaboration and community.

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Getting Involved in LETSI

- **Contribute to SCORM 2.0 Workshop**
 - Contribute a white paper (DITA-S1000D opportunity ?)
 - Participate in Program Committee
- **Participate in LETSI WG**
 - Business Requirements WG
 - Strategic Communications WG
 - Teaching & Learning Strategies WG
 - Technical Roadmap WG
- **For more information ...**
 - LETSI wiki - <http://www.letsy.org>
 - Email - info@letsy.org

Slide 19

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The Future of SCORM with S1000D



Part 4

Example LETSI White Paper Topic

Learning Content Models, Learn Codes and Aggregation
+
S1000D Profile of SCORM
+
S1000D SCORM API

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A. Learning Content Models, Aggregation and Learn Codes

Name, identify and structure technical learning content...

- 2005-2006 prototypes and studies put technical learning information in S1000D data modules and used them as assets. Life cycle logistics improvement

- 2007 work in S1000D training subcommittee developed three change proposals to support technical learning in S1000D v4

- Learning Schema Data Module

- Learn Code in Data Module Code

- Learning Aggregation Model

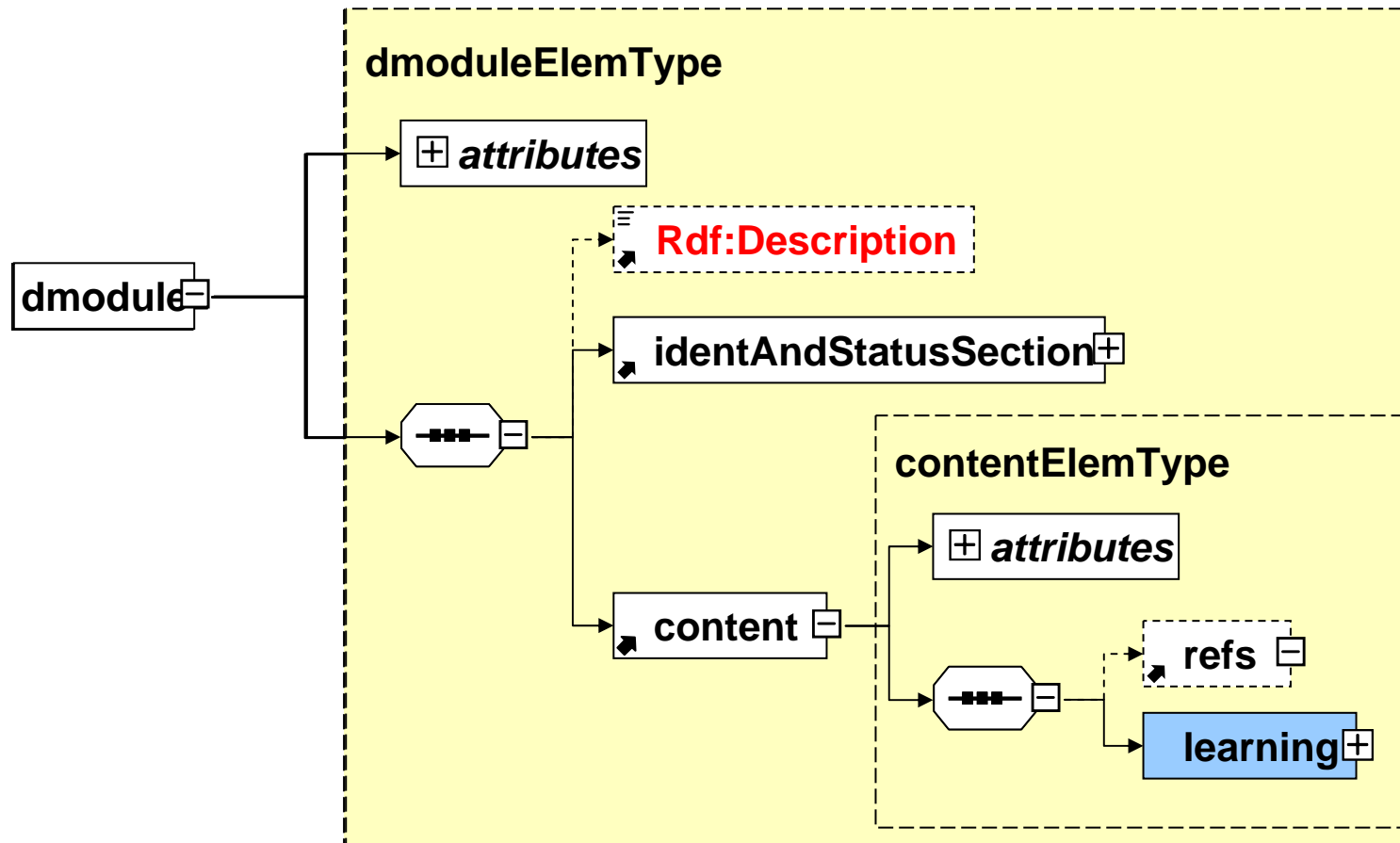
Learning Schema Objectives in S1000D

1. Supplement SCORM with structured DM markup for technical learning content (SCORM is not a markup specification)
2. Apply XML structure to all phases of course development: lesson plans, overview content, main course content, summary content and assessment content
3. Apply file naming and configuration to technical learning content
4. Fold training into life cycle data management, especially ECP impact notification

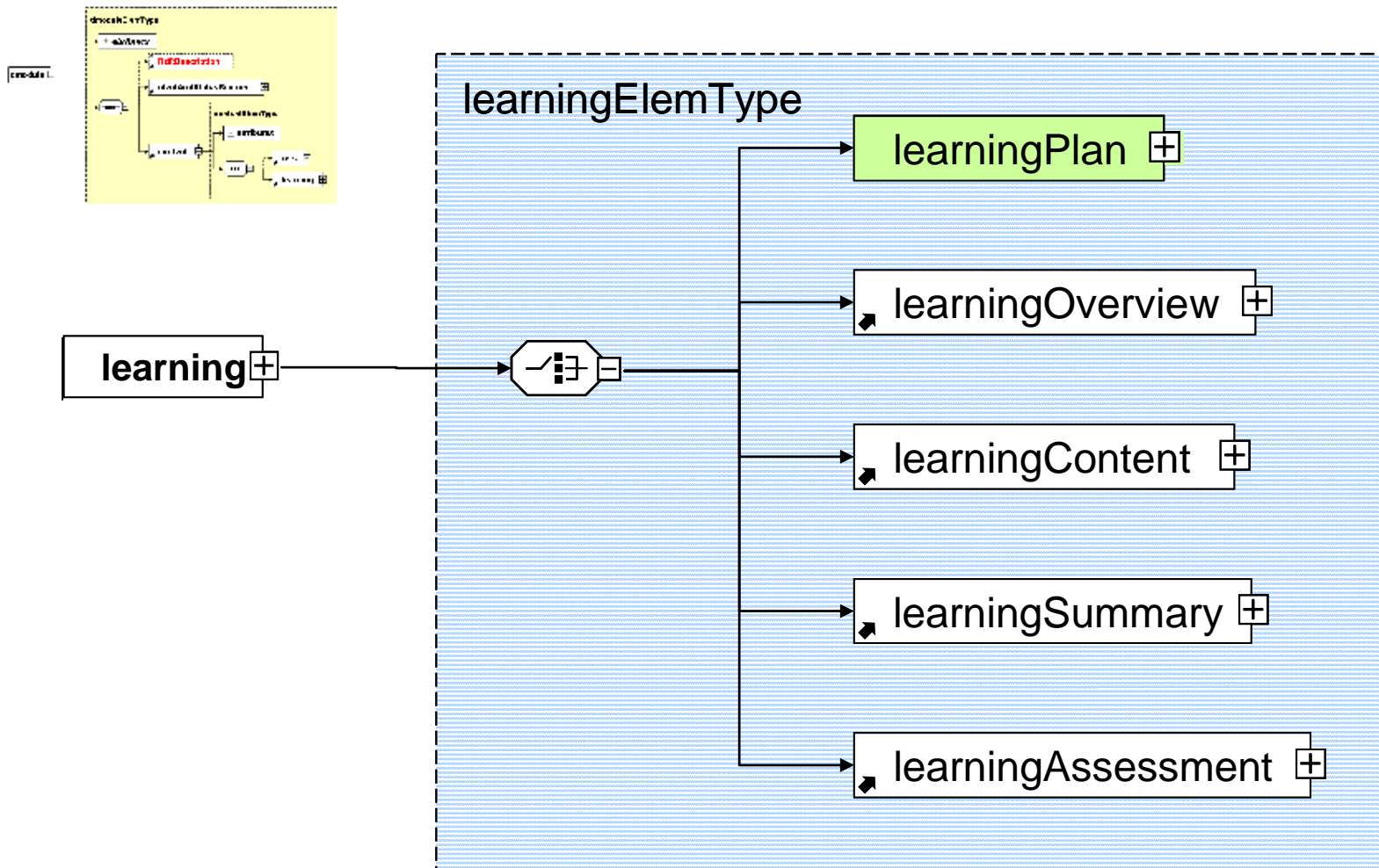
Information Model Roots in DITA

- DITA learning subcommittee met for (approx) ten months in 2007; five groups developed five schemas for course content

Learning <learning> Wrapper Illustrations
Top level Learning DM



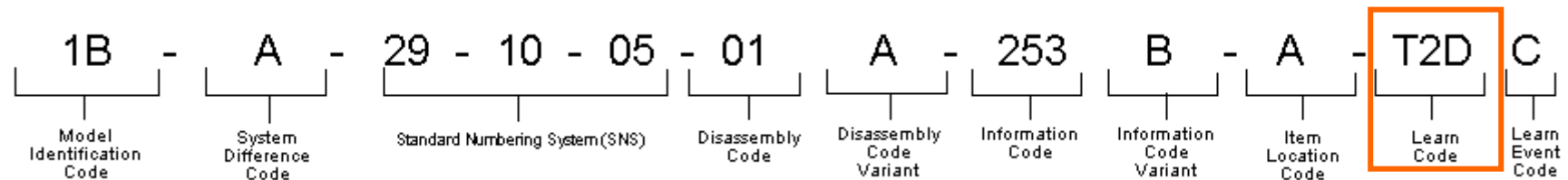
<learning> Wrapper



B. Learn Code Objectives

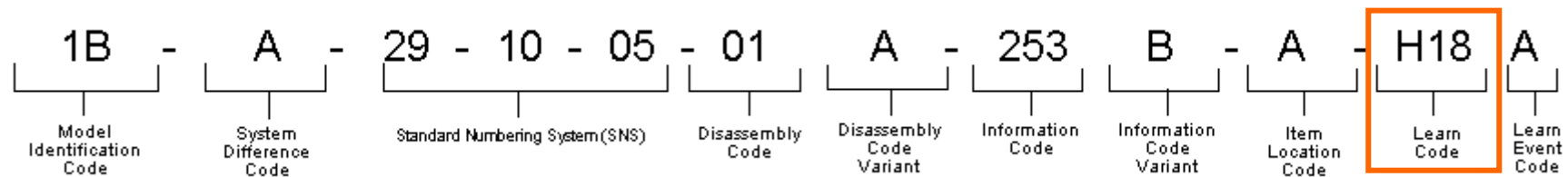
1. Provide instructional design and human performance technology information in the data module code
2. Indicate what branch of the learn code is used in the learning data module

- Training (“T”) learn codes have been added to the DMC to provide a more robust and instructionally coherent means of creating and identifying training data modules



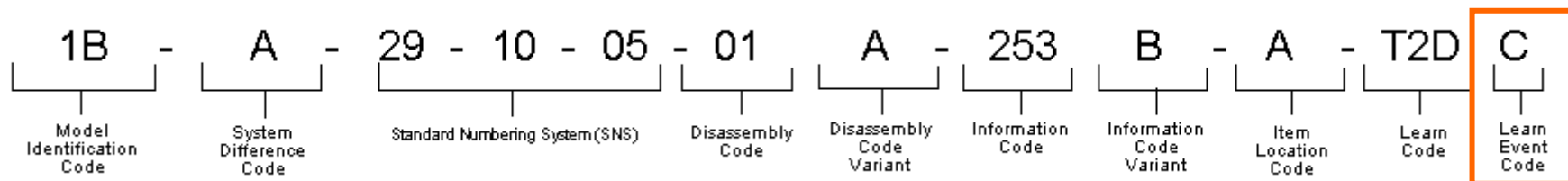
- Sample “T” Learn Codes:
 - 2D = Enabling Objective for Intellectual Skill of the Procedure Type
 - 43 = Static Content for Concept Learning
 - 57 = Learning Guidance provided as a Demonstration

- Human Performance Technology (“H”) learn codes have been added to provide an organization with a means to define and capture requirements of an S1000D project to plan and evaluate technical and training data modules



- Sample “H” Learn Codes:
 - 18 = Work Environment Information from Environmental Analysis
 - 31 = Performance Support Requirements
 - 53 = Summative Analysis Data on Job Transfer (Level 3)

- Learn schema has been added to capture “H” and “T” learning content
 - Contains five optional branches that accommodate common structures for learning content
- Learn Event Code was added to signify in the DMC which branch of Learn schema is used for the content



Uses the “Content Branch” of the Learn Schema

S1000DBIKE-A-10-10-00-00A-520A-A-T4CB

Animation of a procedure...

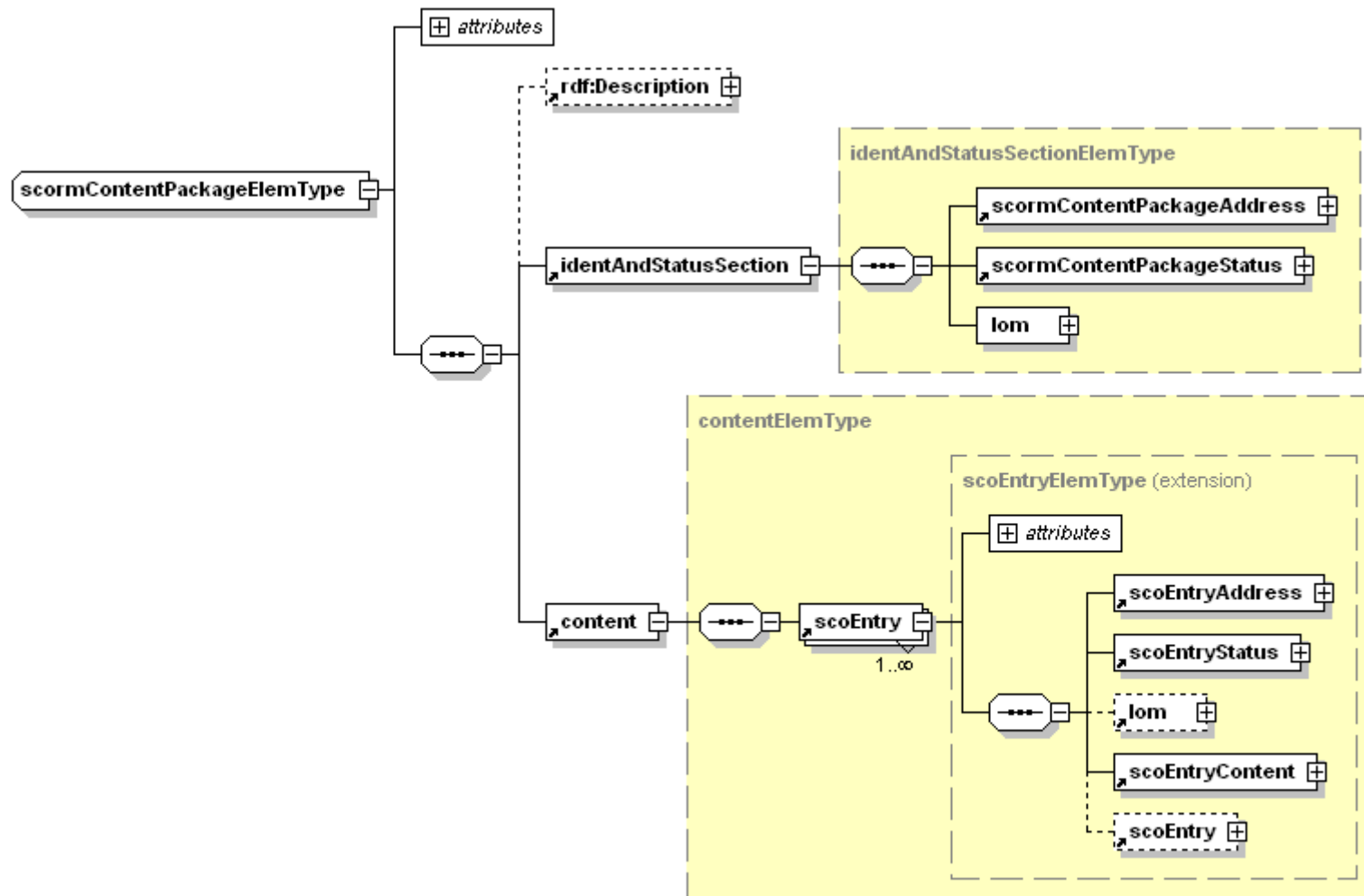
...that uses the Overview Branch of the learn schema.

LearnCode 4C = Animated Content – Procedure
LearnEventCode B = Overview

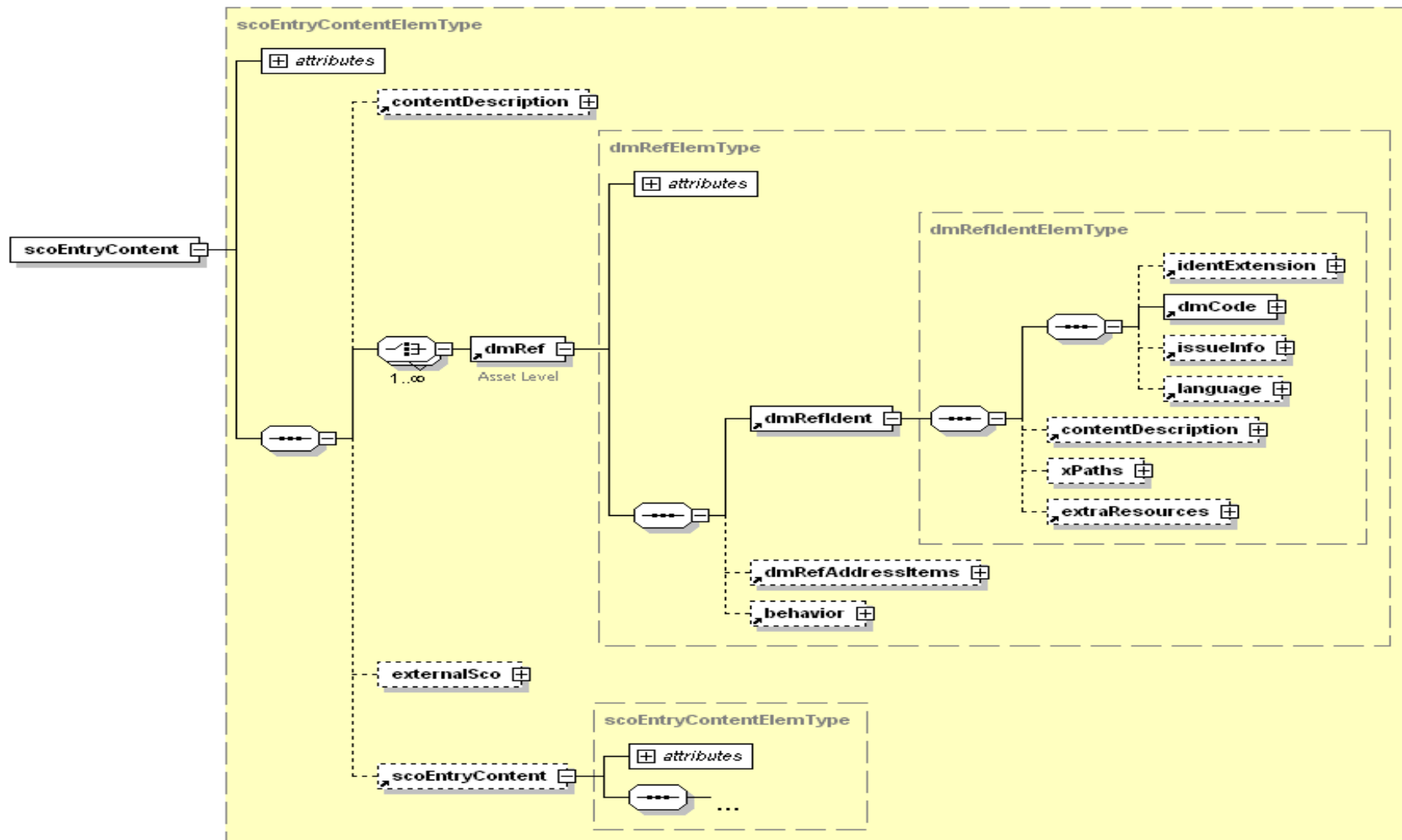
C. Learning Aggregation Objectives

- Used S1000D Publication Module (PM) as a baseline
- Made a copy of PM and renamed it “scormContentPackage”
 - **IDSTATUS Wrapper**
 - Changed “PM” prefix to “ScormContentPackage”
 - Added LOM to describe content package
 - Additional training-specific elements
 - **CONTENT Wrapper**
 - Changed “PM” prefix to “SCO”
 - Added “Xpaths” reference
 - Added multimedia objects reference
 - Added external SCO reference
 - Added LOM to describe SCO

The scormContentPackage Aggregation Model – High Level.



scoEntryContent Model



A Semantic Caveat

S1000D Content Package and SCO

VS

SCORM Content Package and SCO

Harmonize through terminology:

- **Maintains parallel groupings between pre and post production**
- **S1000D does not use CP or SCO to “launch” anything**
- **They are limited to aggregation and meta data mechanisms**

Learning Content Models, Aggregation and Learn Codes

Plus -

An S1000D Profile of SCORM

What is now possible:

How S1000D and SCORM can blend into a “profile”

– *What is a S1000D profile of SCORM?*

- The replacement of native SCORM functions by like S1000D functions
- A profile is the first opportunity to define “harmonization”

Function	S1000D	SCORM
Aggregation	PubModule, scormContentPackage	IMS Manifest
Sequencing	Process Data Module	IMS Simple Sequencing
“Granularization”	Data Modules	Sharable Content Objects
Meta Data	<idStatus>, <pmStatus>, <scormContentPackageStatus>	Learning Object Metadata (Institute for Electronics and Electrical Engineers, LOM)
Content	Learning Data Modules	No reference to content and format
Reporting and Interfacing	Data and communication protocol not specified	IEEE ECMA Script API for Content-to-Runtime Services Communication

Learning Content Models, Aggregation and Learn Codes

Plus -

S1000D Profile of SCORM

PLUS –

An API Bridge Between S1000D and SCORM



The ADL Partnership Opportunity - Harmonizing S1000D and SCORM

S1000D and SCORM:

Enabling Integrated Data at Advanced Distributed Learning

Dr. Robert Wisher

Director, Advanced Distributed Learning Initiative
Office of the Secretary of Defense
Personnel & Readiness, Readiness & Training

The ADL Partnership Opportunity - Harmonizing S1000D and SCORM

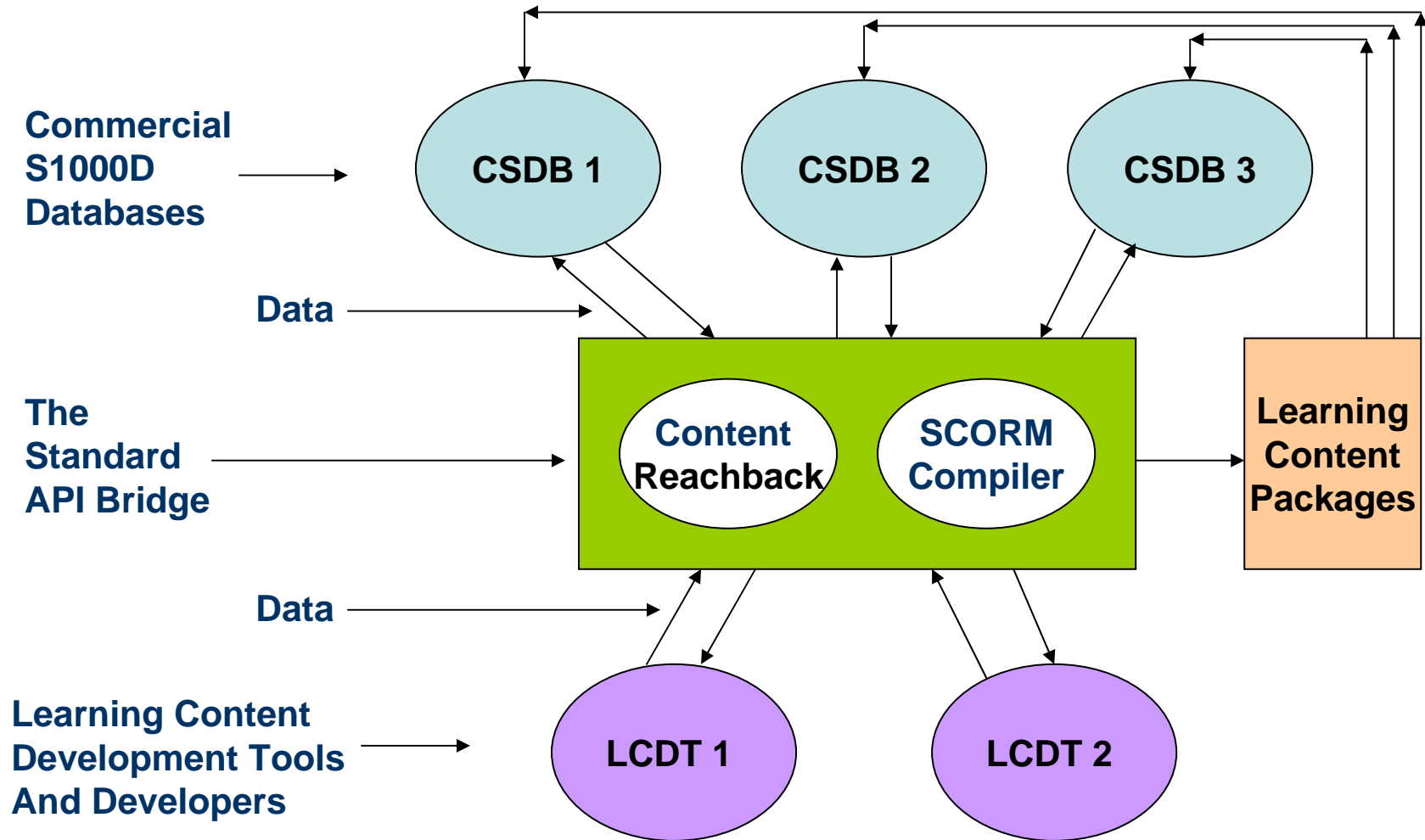


A new standardized bridge is needed to harmonize the standards

- The bridge will provide two important learning content development requirements:
 - Standardized access to S1000D structured information
 - Standardized process to produce SCORM packages



The ADL Partnership Opportunity - Harmonizing S1000D and SCORM



Learning Content Models, Learn Codes and
Aggregation

+

S1000D Profile of SCORM

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S1000D SCORM API

=

***Performance*SCORM**

A S1000D Training Subcommittee Initiative

Summary and Conclusion

1. AICC invents interoperability
2. Growth of learning specification bodies
3. ADL is born and integrates specifications into SCORM, a reference model
4. The growth of SCORM and the The Melbourne Declaration as an agreement to pass along the SCORM stewardship
5. The Birth of LETSI
6. **PerformanceSCORM** as an example LETSI-supported reference model

Contact Information

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