Advanced Distributed Learning: Experience API Overview

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The ADL Initiative

Highest quality education and training
anytime and anywhere.
SCORM*

SCORM enables an interoperable e-learning environment that has become the de facto global learning standard.

*Sharable Content Object Reference Model
“So some things get invented because it is suddenly possible to invent them.”

- Vint Cerf
What Are the Use Cases?
How do we *enable* enhanced learning experiences?

Unlock the power of data to spur innovation and improve quality
Move from managing “documents” to managing discrete pieces of open data and content
Information-Centric Approach

Presentation Layer

Public Digital Services

Private Digital Services

Platform Layer

Systems, Processes, Management & Web APIs

Information Layer

Open Data & Content (Information)

The Layers of Digital Services
Leveraging Data in Games

- NASA Topography Data brought real slopes into SSX Snowboarding
- Zynga changes gameplay on the fly based on player statistics
$1.1B was spent on educational technology in 2012

http://www.cbinsights.com/blog/venture-capital/ed-tech-deals-bubble
Next Gen “SCORM”

Learn From:
- Intelligent Tutors
- Mentors and peers via social networks
- Self-Discovery

Learn Using:
- Games
- Virtual Worlds
- Intelligent content

Access From Any Device

Personalized and Brokered Content
- Just-in-Time
- Just-for-You
Training and Learning Architecture (TLA)

- Experience Tracking (xAPI)
- Learner Profile
- Content Brokering
- Competency Networks
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LEARNING IS HAPPENING EVERYWHERE.
PEOPLE LEARN IN MANY PLACES, DOING MANY THINGS.

COLLECT THE EXPERIENCES THAT MATTER.
THIS API RECORDS ACTIVITIES AND DELIVERS DATA THAT IS:
- QUANTIFIABLE
- SHARABLE
- TRACKABLE

Credit: Liz Burow (@Burlix)
Traditional Tracking

Learner Experiences

Movement
Responses
Decisions
Delays
Questions
Searches

Tracked Learner Data

Score
Project Tin Can

- ADL BAA Funded Research Effort
- Code-named “Project Tin Can” Rustici Software
- Requirement to “modernize” SCORM communication framework (but created new opportunities)
- Community-derived use cases, interviews, over 100 white papers
Project Tin Can Top 5 Requirements

1. Should support a variety of content types
2. Should be simple to implement
3. Should support offline or disconnected scenarios
4. Portable content (interoperable across platforms)
5. Improved access to run-time data
What is the Tin Can API?

- Result of Project Tin Can
- Tracks experiences, informal learning, real-world experiences (not just completions)
- Allows data storage AND retrieval (ex. 3rd party reporting and analytics tools)
- Enables tracking mobile, games, ITS, and virtual worlds experiences
- Developed by open source community
Comparing xAPI and the SCORM RTE

- Course tracking: Bookmarking, completion, time, pass/fail, scores
- Multiple scores per object, unlimited test results and interactions
- No LMS required
## Comparing xAPI and the SCORM RTE

<table>
<thead>
<tr>
<th>Feature</th>
<th>SCORM Run-Time Environment</th>
<th>xAPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>No web browser required</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Supports offline scenarios</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Control over your content</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Tracks web or native apps</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Tracks serious games, simulations, virtual worlds</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Tracks real-world, informal learning &amp; performance</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Tracks team-based learning</td>
<td>X</td>
<td>✓</td>
</tr>
</tbody>
</table>
Activity Streams

- http://activitystrea.ms
- Collaboration between Google, Facebook, Microsoft and others
- Allows reporting of experiences, not just completions
- Format: <Actor> <Verb> <Object> (I did this):

Simple Statement:
I (actor) watched (verb) a video on protecting employee data (object)

Complex:
Example (Formal) Learning Stream

- John Connor attempted “The War of 1812, Part 1”
- John Connor watched “The Battle of New Orleans Video”
- John Connor attempted “The War of 1812, Assessment”
- John Connor answered “Question 1” with “True”
- John Connor answered “Correctly”
- John Connor answered “Question 2” with “False”
- John Connor answered “Correctly”
- John Connor answered “Question 3” with “a”
- John Connor completed “The War of 1812, Assessment”
- John Connor scored “90%” on “The War of 1812, Assessment”
- John Connor satisfied objective “Battles of the War of 1812”
- John Connor mastered objective “The War of 1812” to level “1”
- John Connor earned “The War of 1812 – Level 1 Badge”
Example (Informal) Learning Stream

- Walter Isaacson authored [Steve Jobs Biography]
- David proofread [Steve Jobs Biography]
- Margaret approved [Steve Jobs Biography]
- Simon & Schuster published [Steve Jobs Biography]
- John purchased [Steve Jobs Biography]
- Ted read [Steve Jobs Biography]
- Philip shared [Steve Jobs Biography]
- Steven liked [Steve Jobs Biography]
- Harry reviewed [Steve Jobs Biography]
Where Is The Data Stored?
# What is an LMS?

Learning Management System (LMS)

<table>
<thead>
<tr>
<th>User Management</th>
<th>Learning Records</th>
<th>Scheduling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Management</td>
<td>Statistics</td>
<td>Grade Book</td>
</tr>
<tr>
<td>Run-Time</td>
<td>Repository</td>
<td>Search</td>
</tr>
<tr>
<td>Player</td>
<td>Sequencing</td>
<td>Delivery</td>
</tr>
<tr>
<td>Preferences</td>
<td>Reports</td>
<td>Assessment</td>
</tr>
</tbody>
</table>
What is a LRS?

Learning Record Store (LRS)

Learning Records
Act on It

LRS = Learning Record Store
Does xAPI replace SCORM?

- No. The xAPI can modernize the SCORM Run-Time Environment (RTE), but doesn’t replace all aspects of SCORM.
- **Implication:** It can easily work with SCORM. It does not replace SCORM. New SCORM content developed could use the xAPI.
SCORM Investment

Does this mean all of the time and money we invested in SCORM content will be worthless?

• No. SCORM is still useful for tracking web-based desktop courses.

• If your learners need mobile access, SCORM will not work alone. SCORM will continue to work (durability) in your LMS.

• **Implication:** Is your current investment in SCORM producing good results?
Conversion

Will we need to convert our training content from SCORM to the xAPI?

• Only if there is a requirement.

• xAPI isn’t a new version of SCORM.

• Need to support mobile delivery of your course? Don’t convert. Think mobile first.

• Implication: Is there a need? You could easily make your SCORM content support the xAPI. But determine your needs. Is it for more robust reporting/analytics or mobile? If so you will need to setup a LRS and also redesign your content user interface (if mobile).
Can SCORM content packaging work with xAPI?

- Yes. A SCORM Content Package can use xAPI

- **Implications:**
  - Would require updating the content package
  - Could simply translate communications
  - Or could be used to capture additional data
• Version 1.0 Released in April 2013
• Over 30 Adopter Products
• Over 100 Contributors

xapi.adlnet.gov
TLA in Action

Content

Comp. Networks

Activities

Learner Profile

Learner Data

Registry

Publish / Harvest

Paradata
(they) did this

Upload / Download

Broker

xAPI
I did this
Resources

ADL Training & Learning Architecture (TLA)
http://www.adlnet.gov/tla

TLA Experience API (Tin Can API) & Public Groups
http://xapi.adlnet.gov

Whitehouse Digital Government Document
Thank you!

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Backup
Training and Learning Architecture (TLA)

- Experience Tracking (xAPI)
- Learner Profile
- Content Brokering
- Competency Networks
Objectives, standards, or competency information needs to be shared across learning applications.
Competency Structure vs. Actual Competencies

Represent and structure information, but does not set out any specific learning outcome or competence definitions or structures.

21st Century Soldier Competencies

- Character and accountability
- Comprehensive fitness
- Adaptability and initiative
- Lifelong learner (includes digital literacy)
- Teamwork and collaboration
- Communication and engagement (oral, written, negotiation)
- Critical thinking and problem solving
- Cultural and joint, interagency, intergovernmental, and multinational competence
- Tactical and technical competence (full spectrum capable)
Existing Competency Frameworks

• MedBiquitous Competency Framework
  • ANSI accredited technical standard for representing competency frameworks
  • Developed for healthcare education

• Achievement Standards Network (ASN)
  • Open specification used with K-12 standards

• Integrating Learning Outcomes and Competences (inLOC)
  • Recently completed European funded project

Each provides methods to model definitions, structures, and relationships
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TLA Learner Profiles

Competencies

Learner Profile
Badges

- Concept of badging is a graphical reward
  - Specific criteria
  - Recognized in a Community of Practice

- Mozilla has an OpenBadges system
  - Criteria can point to Competency Definition or Structure

- Populated within a profile using competency criteria
Tying Data Together

- Objective or competency information can relate personal data together

Learner Profiles

```
Learning Records → Evidence → Badges
```

```
Learning Records → Evidence → Badges
```

Alignment

Competency Network
Training and Learning Architecture (TLA)

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TLA Content Brokering

• **Finding the right content and “teachable moment”**
  - Managing content
  - Support just-in-time learning
  - Enable logical selections of the next activity

• **Multiple research efforts**
  - Learning Registry
  - Open Source Content Repositories
  - Personal Assistant for Learning
Finding Content

- Metadata, repositories, and registries that support discovery and access should align content with objectives, standards, or competency information

**LRMI Properties:**
- name
- about
- author
- educationalAlignment
- ...

**Competency Criteria**