



Advanced Distributed Learning: Experience API Overview

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Supporting the ADL Initiative

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DLCC Virtual Meeting August 2013

The ADL Initiative



Highest quality education and training
anytime and anywhere.

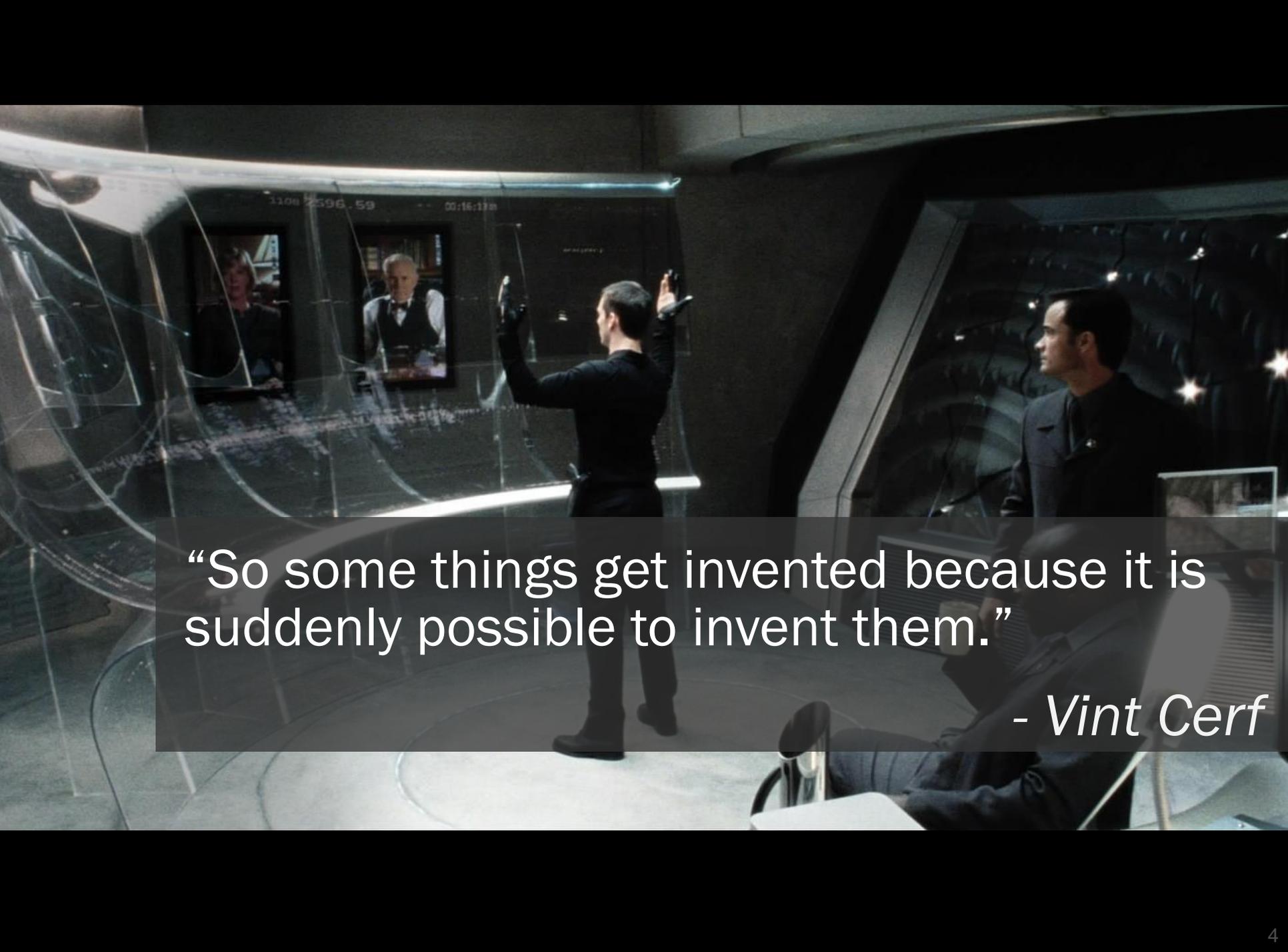


SCORM*

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?



AutoTutor

File Edit Session Plugins Help

How does the operating system interact with the word processing program when you create a document?

Student: The operating system helps you use the word processing program.

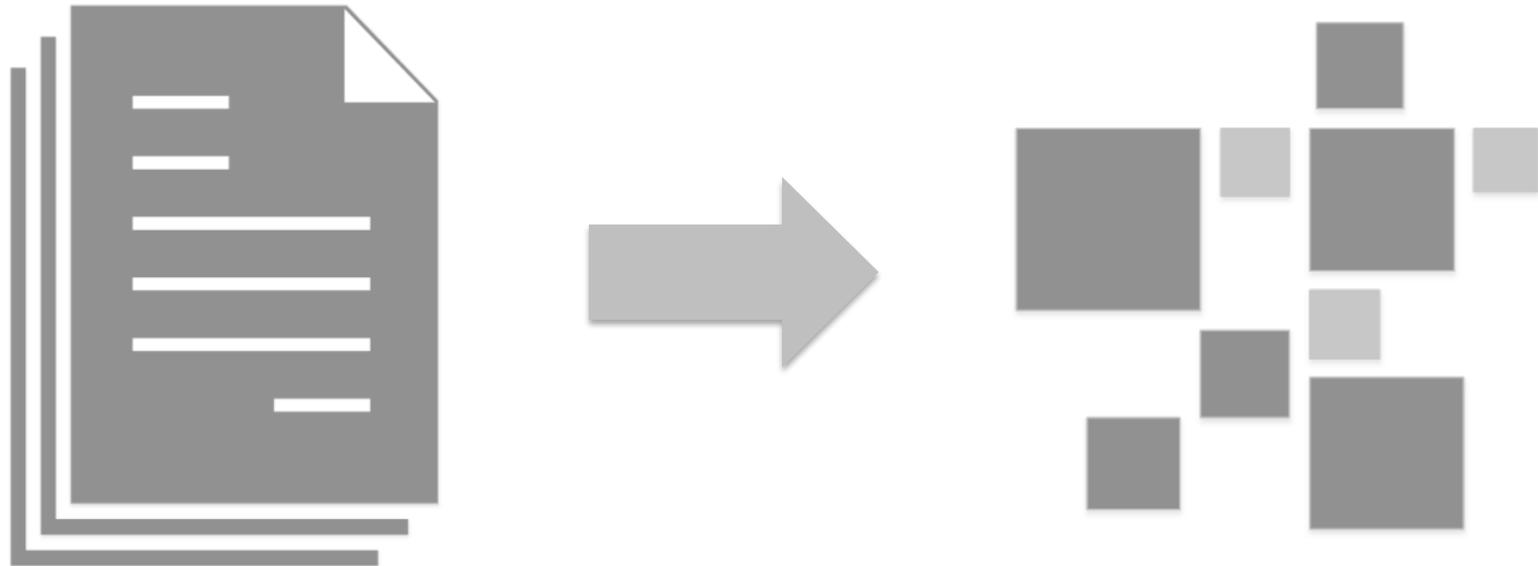
Tutor: possibly
Tutor: We've covered this angle pretty well, but something's missing!



**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

Public Digital
Services

Private Digital
Services

Presentation Layer

Systems, Processes,
Management & Web APIs

Platform Layer

Open Data & Content
(Information)

Information Layer

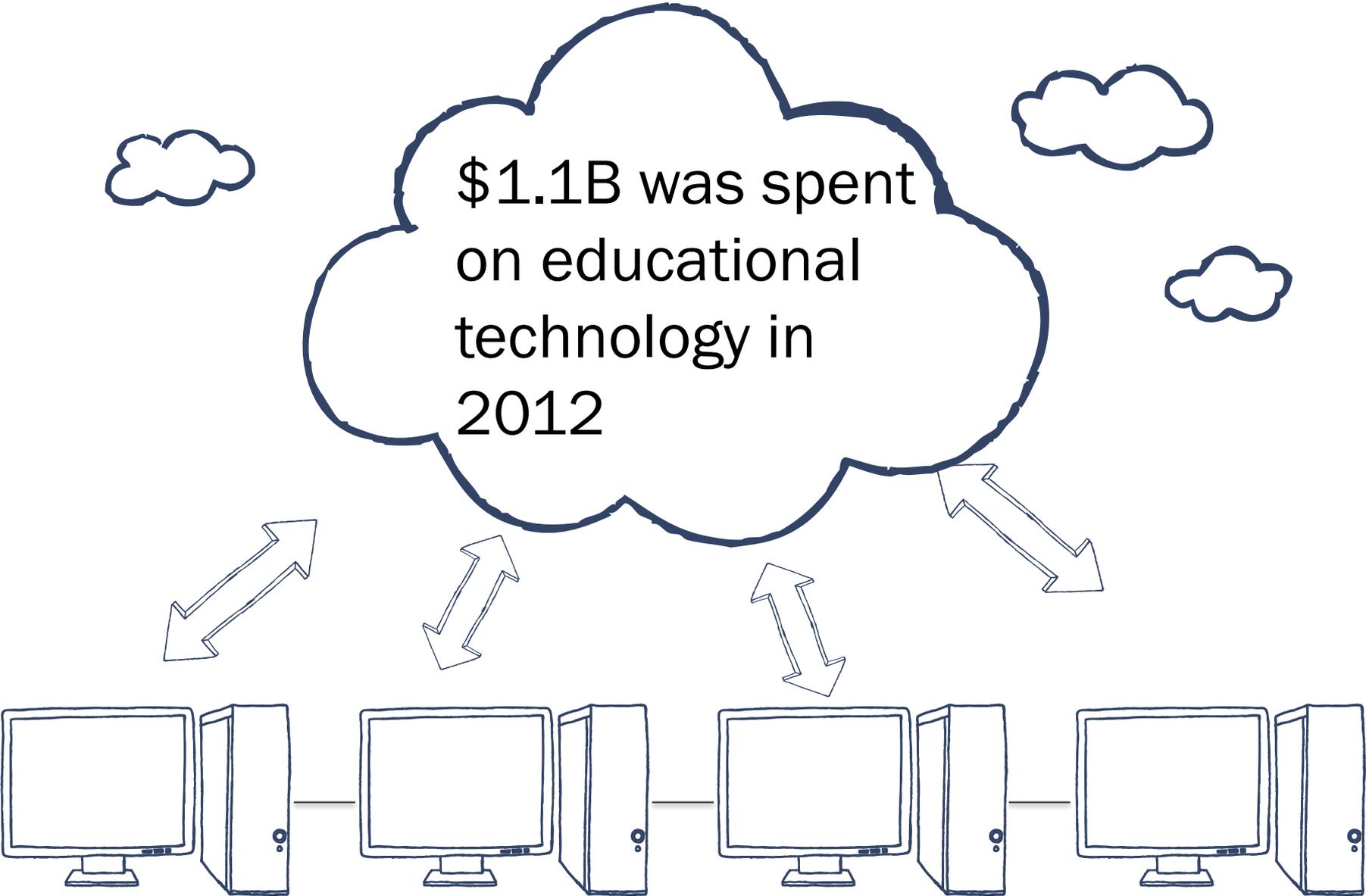
The Layers of Digital Services

<http://www.whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government.html>

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”



**Access From
Any Device**



**Personalized
and Brokered
Content**

- Just-in-Time
- Just-for-You

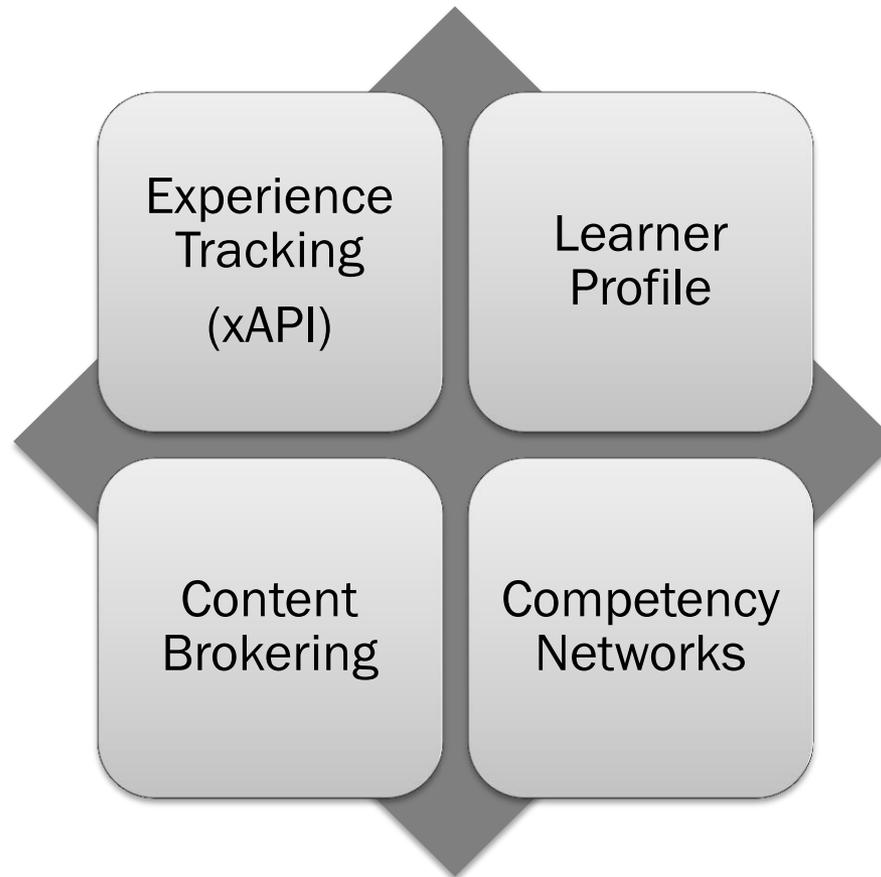
Learn From:

- Intelligent Tutors
- Mentors and peers via social networks
- Self-Discovery

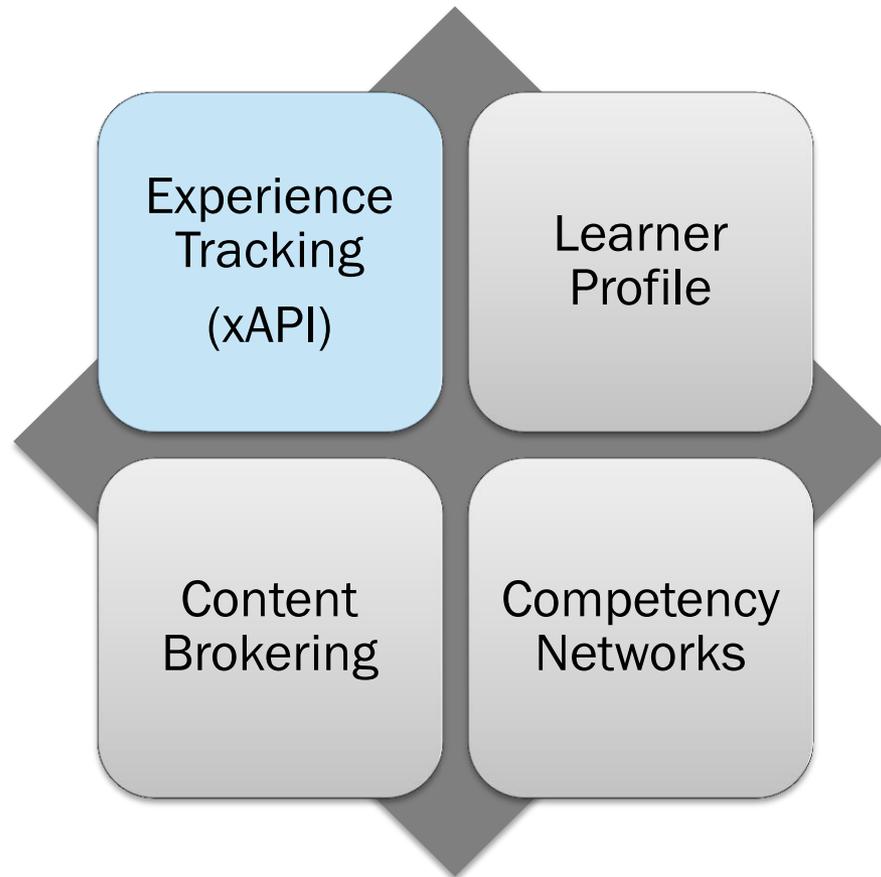
Learn Using:

- Games
- Virtual Worlds
- Intelligent content

Training and Learning Architecture (TLA)



Training and Learning Architecture (TLA)



LEARNING IS HAPPENING EVERYWHERE.

PEOPLE LEARN IN MANY PLACES,
DOING MANY THINGS.



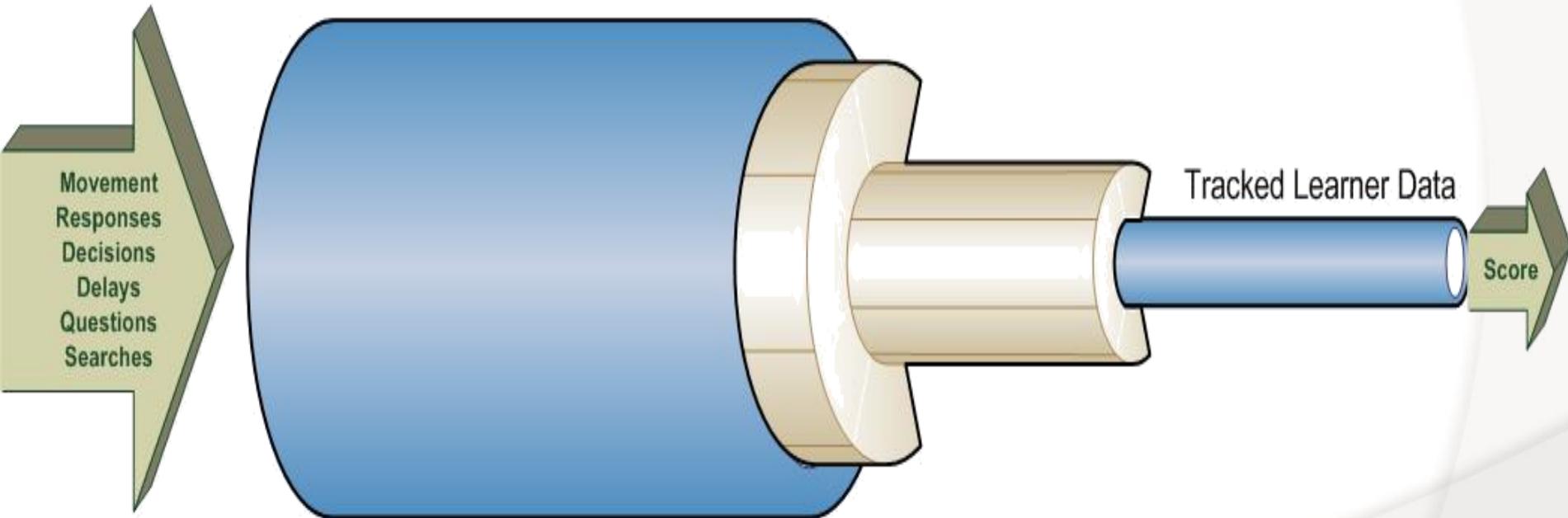
COLLECT THE EXPERIENCES THAT MATTER.

THIS API RECORDS ACTIVITIES
AND DELIVERS DATA THAT IS:

- QUANTIFIABLE
- SHARABLE
- TRACKABLE

Traditional Tracking

Learner Experiences



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



?

- 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

SCORM
Run-Time
Environment

EXPERIENCE
xAPI

- ▶ **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

SCORM
Run-Time
Environment

EXPERIENCE
xAPI

- ▶ No web browser required
- ▶ Supports offline scenarios
- ▶ Control over your content
- ▶ Tracks web or native apps
- ▶ Tracks serious games, simulations, virtual worlds
- ▶ Tracks real-world, informal learning & performance
- ▶ Tracks team-based learning



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:

in the context of [information assurance certification training] with result [timestamp:2013-0618T18:30:32.360Z].

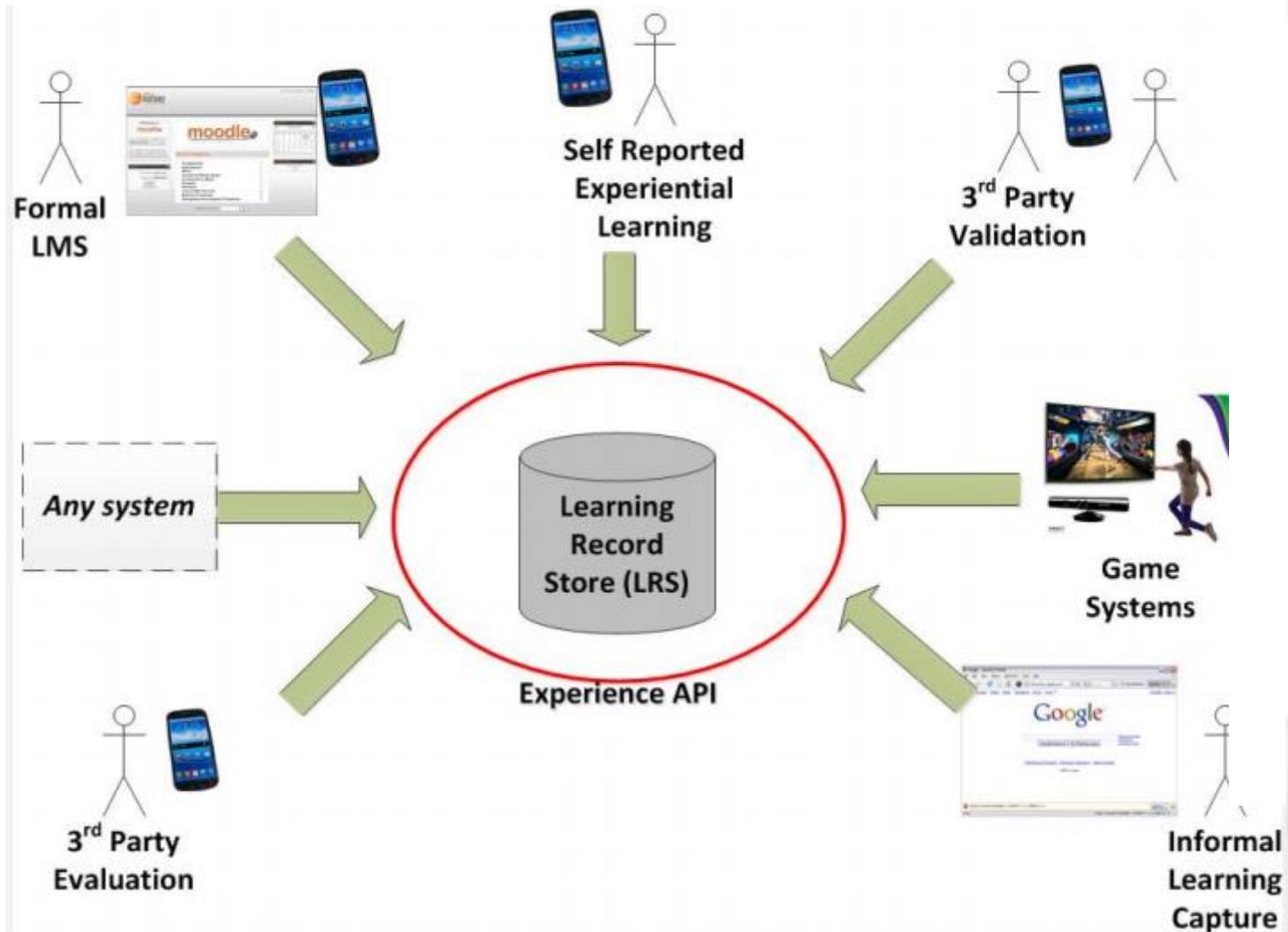
Example (Formal) Learning Stream

- 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)

User Management	Learning Records	Scheduling
Course Management	Statistics	Grade Book
Run-Time	Repository	Search
Player	Sequencing	Delivery
Preferences	Reports	Assessment

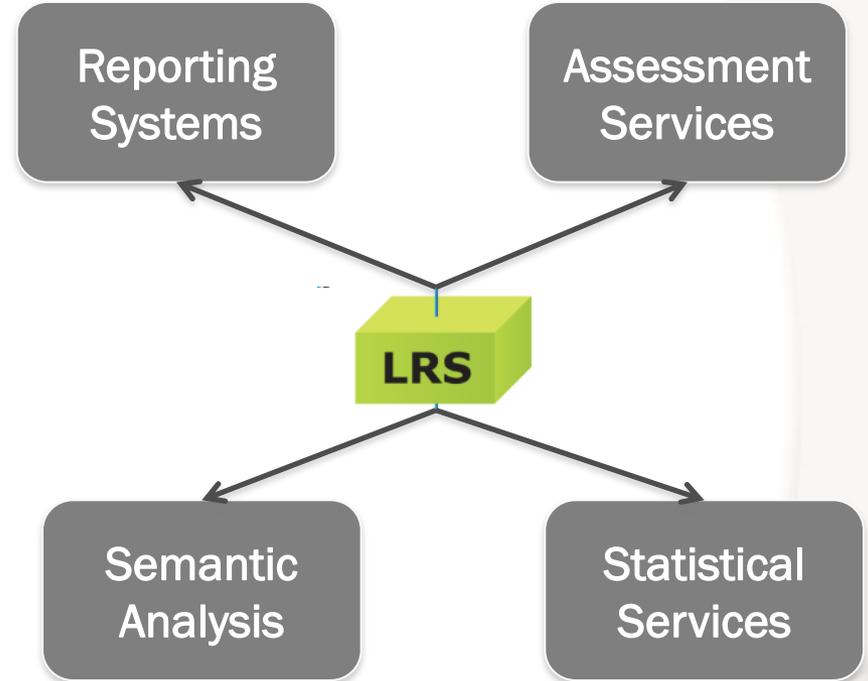
What is a LRS?



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).

SCORM and xAPI



Can SCORM content packaging work with xAPI?

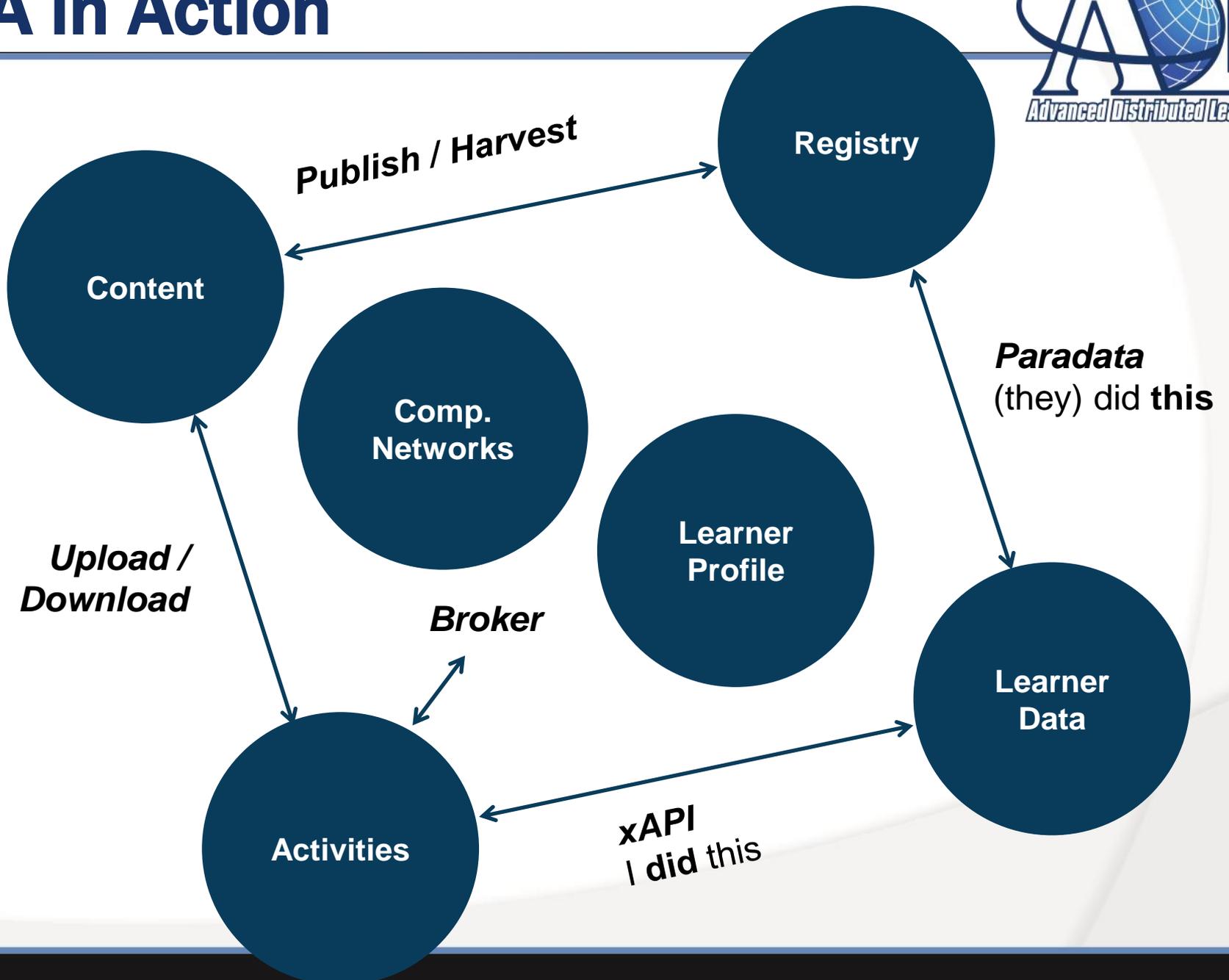
- Yes. A SCORM Content Package can use xAPI
- Implications:
 - Would require updating the content package
 - Could simply translate communications
 - Or could be used to capture additional data

EXPERIENCE API

- Version 1.0 Released in April 2013
- Over 30 Adopter Products
- Over 100 Contributors

xapi.adlnet.gov

TLA in Action



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

<http://www.whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government.html#top>

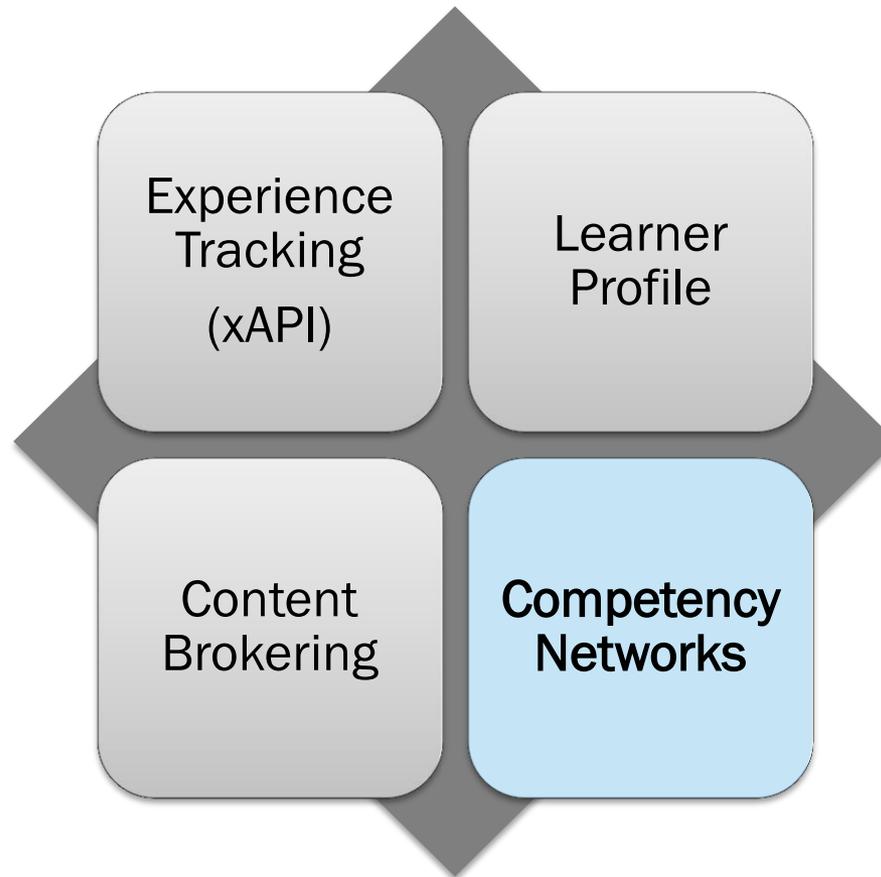
Thank you!



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Backup

Training and Learning Architecture (TLA)



Competency Network



Objectives, standards, or competency information needs to be shared **across** learning applications

Learning Management Systems

Registries & Repositories

Assessment Systems

E-portfolios

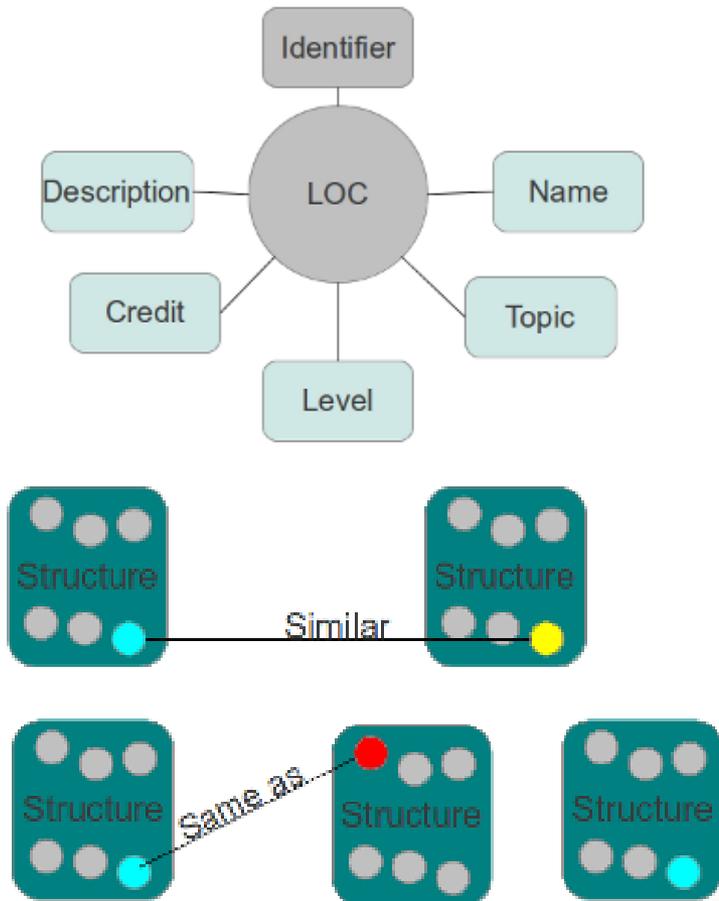
Social Networks



Shared objectives, standards, or competency information

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

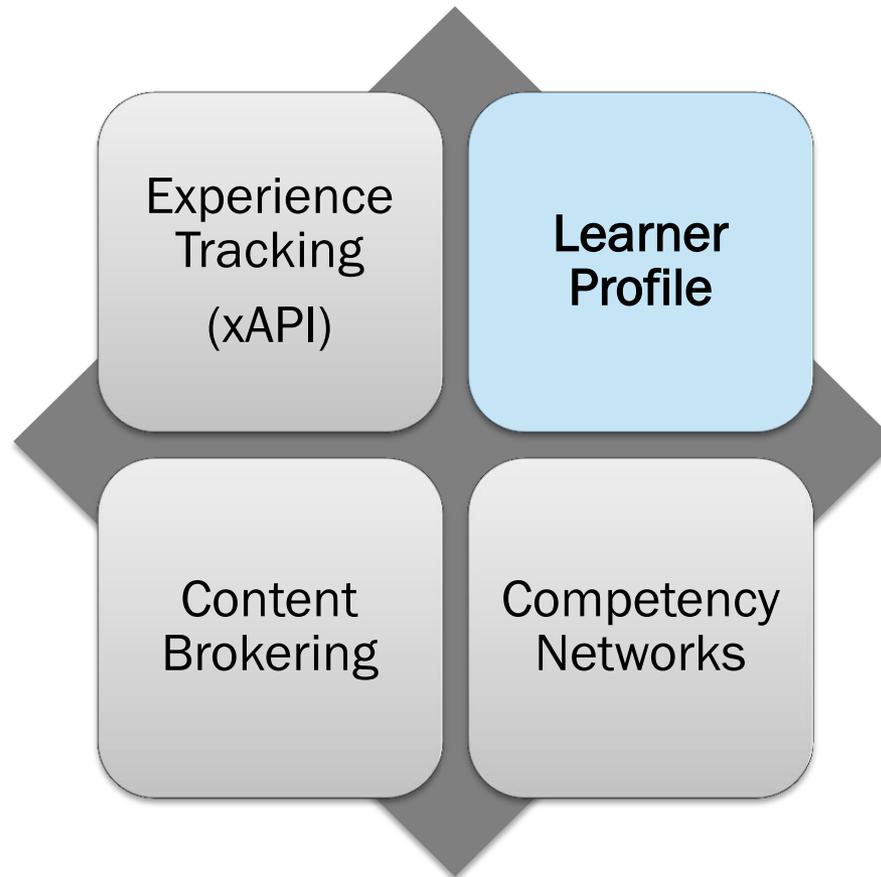
- Character and accountability
- Comprehensive fitness
- Adaptability and initiative
- Lifelong learner (includes digital literacy)
- Teamwork and collaboration
- Communication and engagement (oral, written, negotiation)
- Critical thinking and problem solving
- Cultural and joint, interagency, intergovernmental, 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

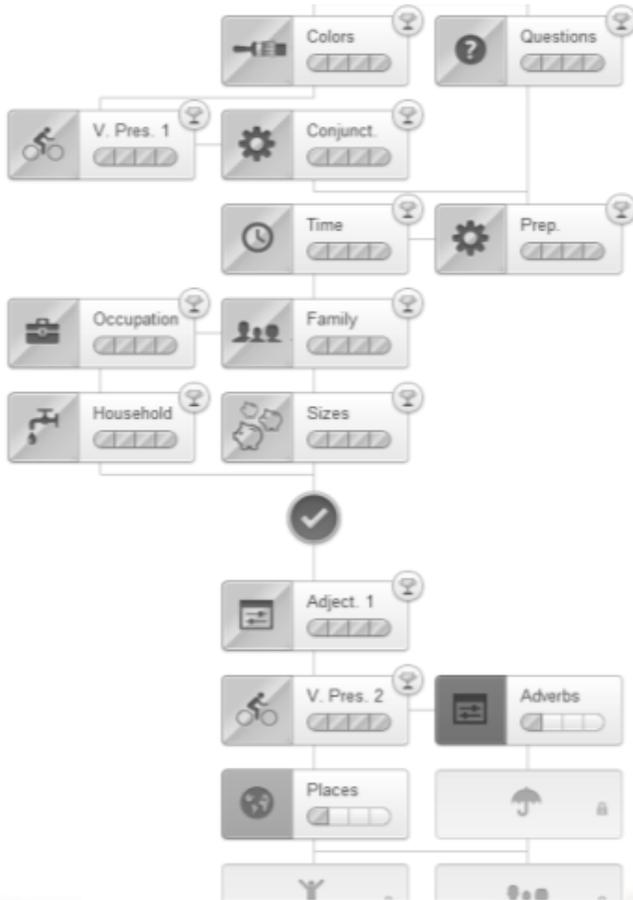
Training and Learning Architecture (TLA)



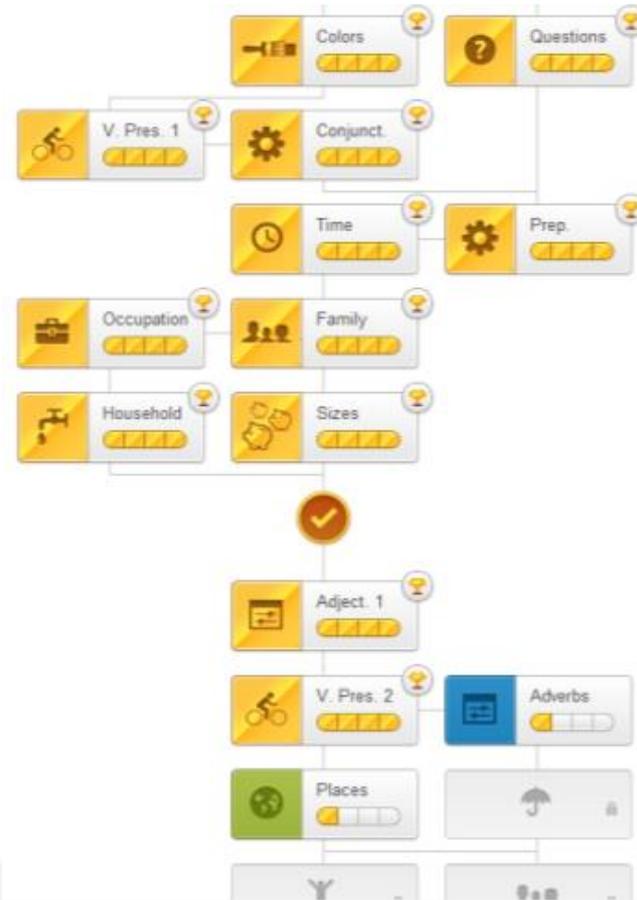
TLA Learner Profiles

■ Definition ■ Proficient ■ In Progress ■ Desired

Competencies



Learner Profile



Badges

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

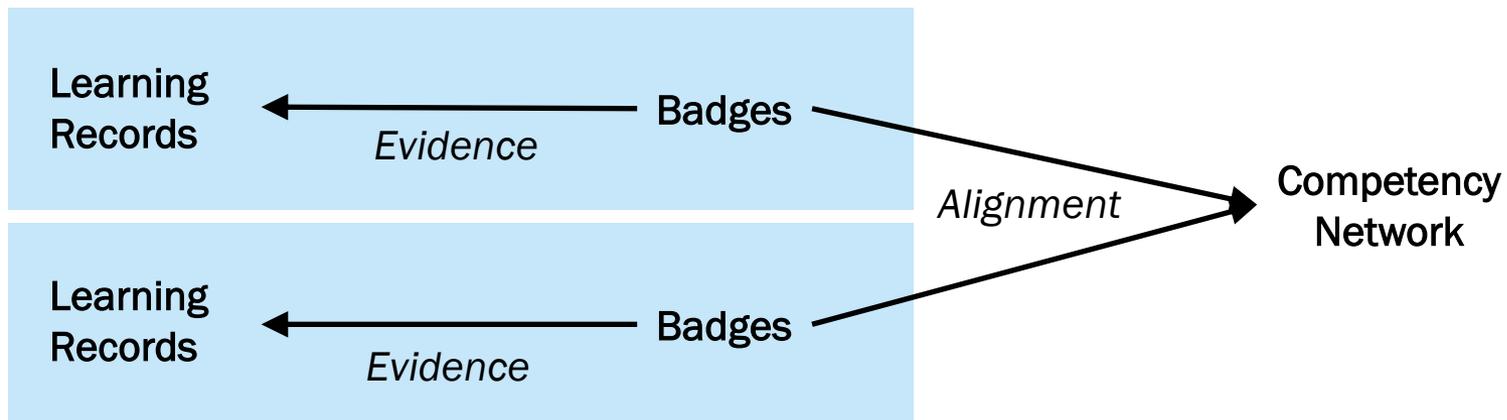


- **Mozilla has an OpenBadges system**
 - Criteria can point to Competency Definition or Structure
- **Populated within a profile using competency criteria**

Tying Data Together

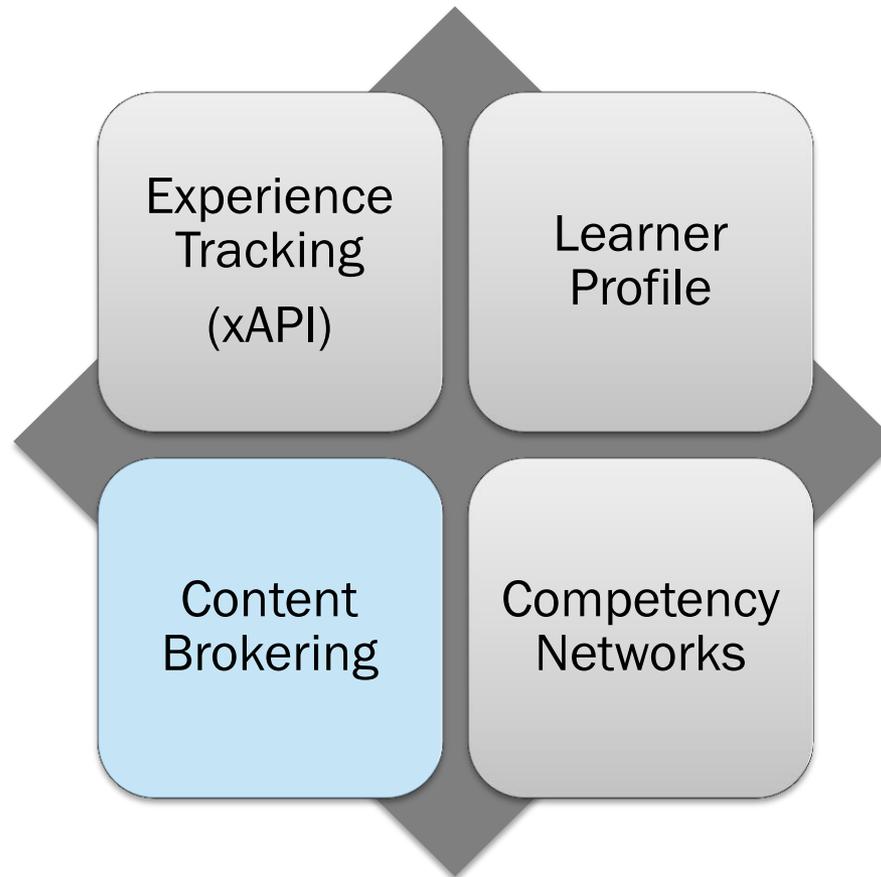
- Objective or competency information can relate personal data together

Learner Profiles



...

Training and Learning Architecture (TLA)



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

