



Making Reuse Real: Standardized Services and Open Source Software

ADL Webinar Series
25 July 2013

Damon Regan, Ph.D.

Contractor with the Tolliver Group, Inc. supporting the ADL Initiative

About the presenter



▶ **Current interests and passions**

- Systems thinking
- Usability
- Reuse
- Competency-based education

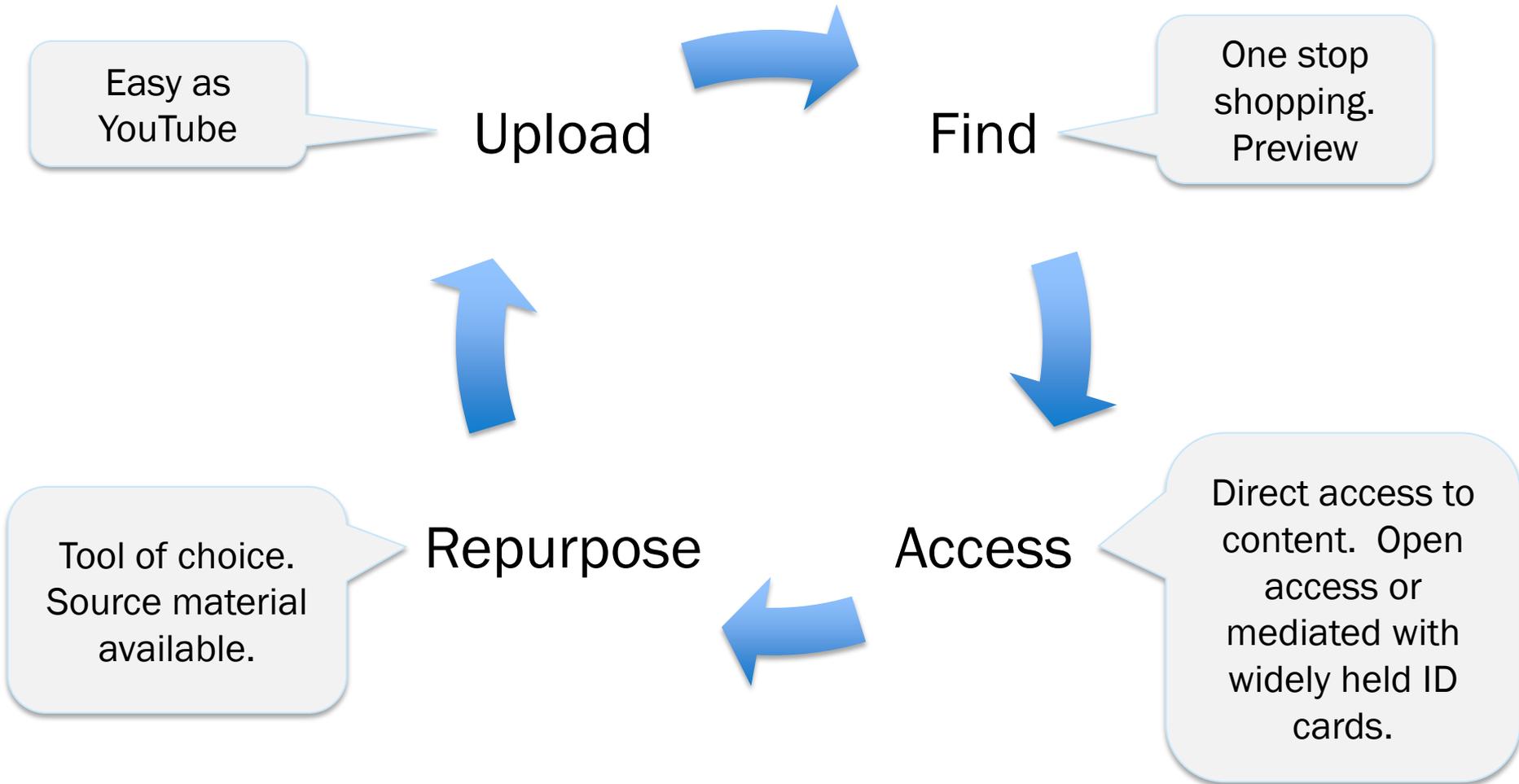
▶ **Educational background**

- Computer Science
- Business
- Instructional Technology

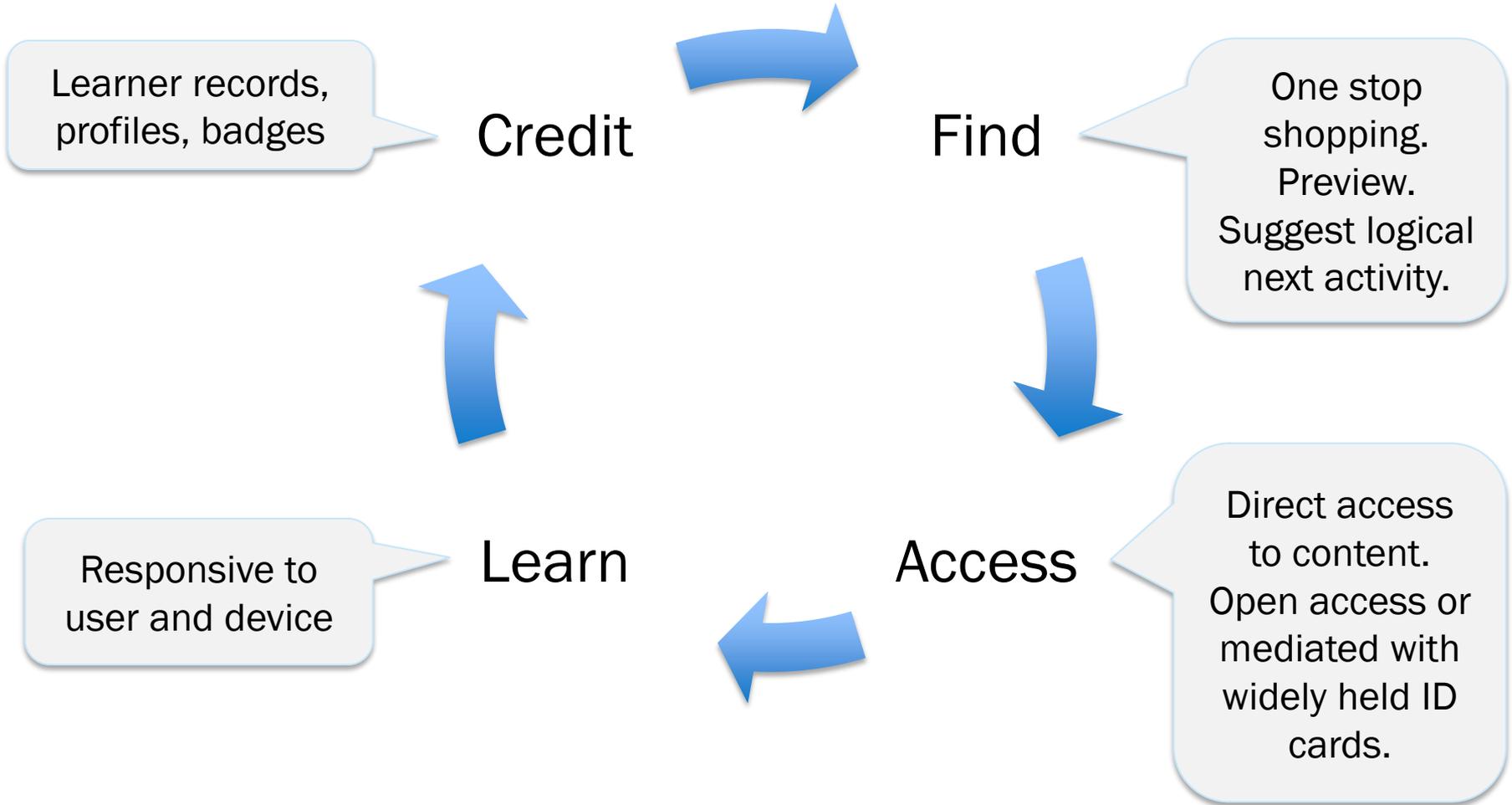
Responsibly reusing learning content should be easy for learners and content developers...

...to enable access to content
anytime and anywhere,
while lowering development time and costs.

Reuse Vision for Developers



Reuse Vision for Learners



**The role of
standardized services
and
open source software**

▶ Integrate vertically

- Local and global infrastructure
- Registries and repositories
- Federation

▶ Integrate horizontally

- Other software solutions
 - Training and Learning Architecture (TLA)
 - Recommendation engines
 - Authoring tools
- Likely key to usability workflows

- ▶ **Provide implementation of standardized services for external systems**
 - Encourage interoperability
 - Avoid fragmentation
 - Enable commercial innovation using permissive licenses

- ▶ **Proliferate the infrastructure and make it visible**
 - Fast and easy to get started
 - Support different organizational scopes

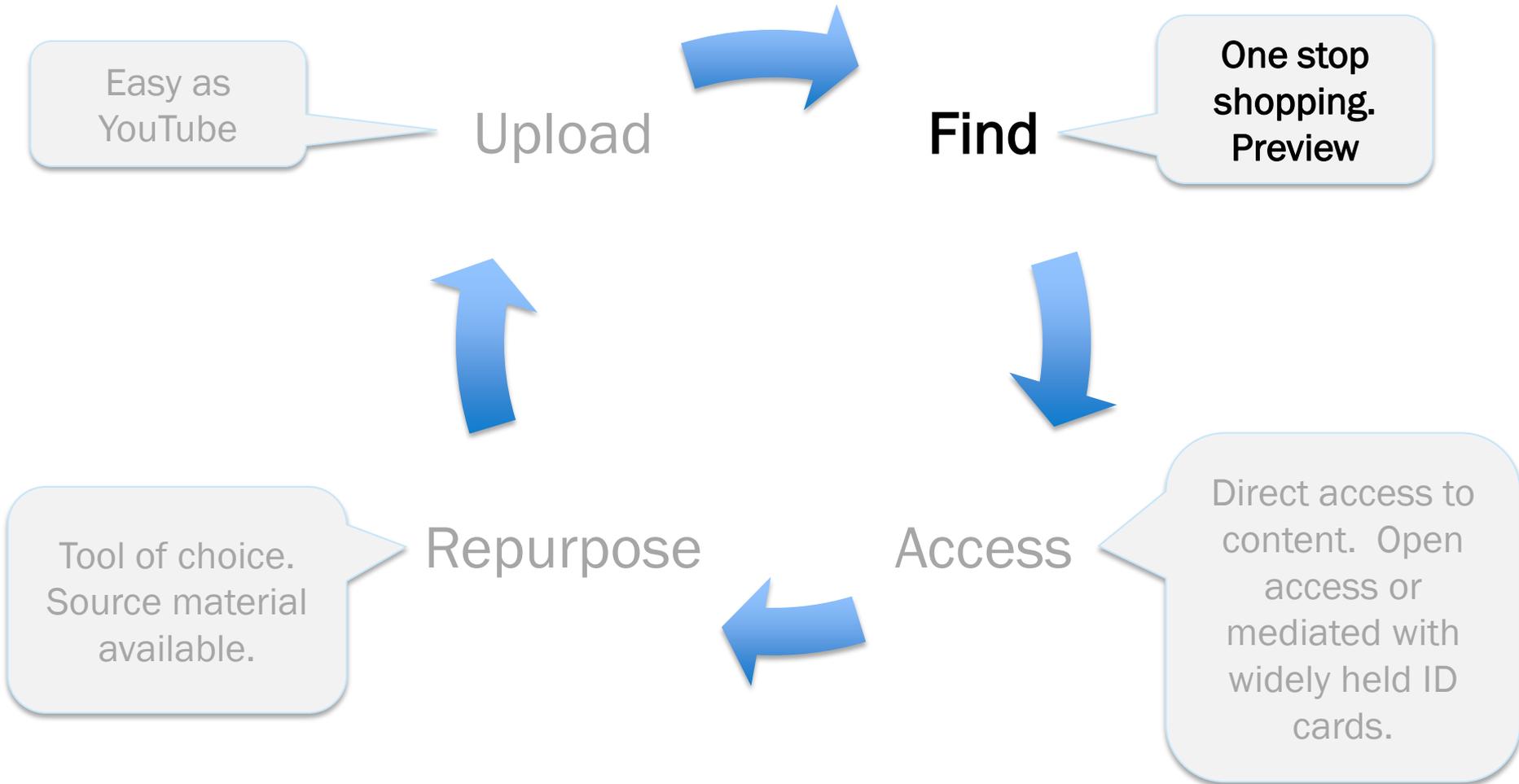
Registry Projects

Role of Registries

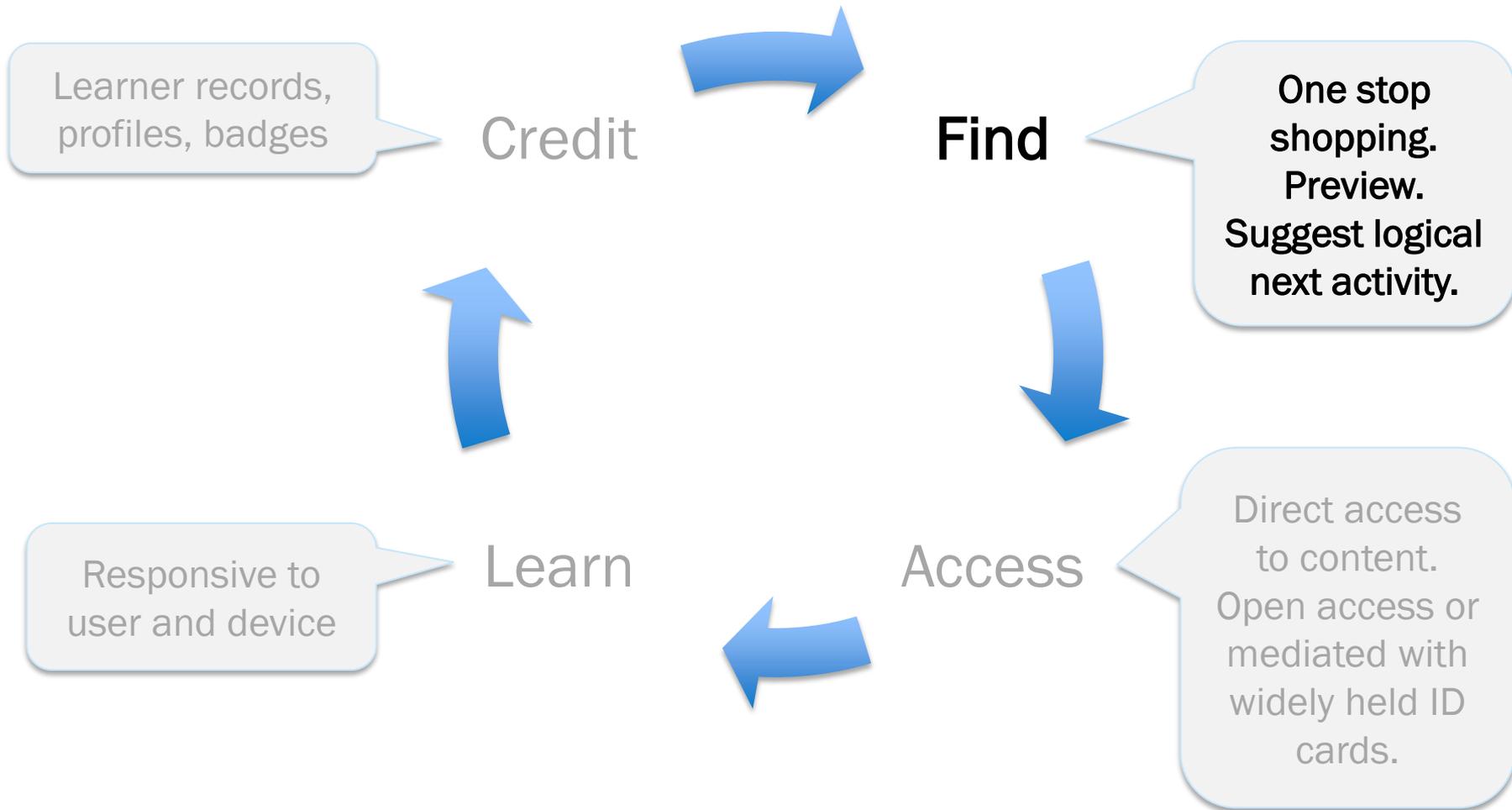


Type of System	Purpose
LMS	Delivery
LCMS	Centralized Authoring
Repository	Content Management
Registry	Discovery

Reuse Vision for Developers



Reuse Vision for Learners



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free.ed.gov

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- ▶ [U.S. History Topics](#) (11,587)
- ▶ [U.S. Time Periods](#) (988)
- ▶ [World Studies](#) (981)

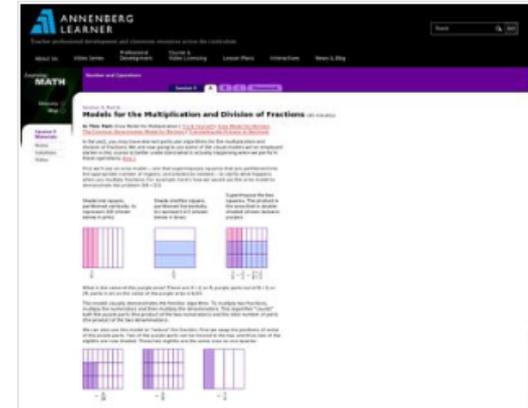
Browse By Standard

Multistate

- ▶ [Common Core Mathematics](#) (521)
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FEATURED RESOURCE

[Models for the Multiplication and Div...](#)
Source: Annenberg Media



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 Harper Lee's To Kill a Mockingbird first appeared on July11,1960. For more, go to FREE: free1.ed.gov/searchres.cfm?...
 Expand

FREE - Federal Registry for Educational Excellence **Beta**

Currently 181,350 learning resources registered

Take me back to the old version of FREE Feedback

Search the Registry

Search

Federal Resources Only

Browse By Subject

- Arts & Music (2,028)
- Health & Phys Ed (138)
- Language Arts (896)
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- Science (62,262)
- U.S. History Topics (11,587)
- U.S. Time Periods (988)
- World Studies (981)

TWITTER

Khan Academy

212,760,517 lessons delivered

KHANACADEMY

Learn almost anything for free

Explore computer science

Education reimaged

Practice

BROWSE OUR LIBRARY

BROKERS OF EXPERTISE

Brokers of Expertise is the place where California educators go to get connected.

Resources

Community

Training

K12HSN Technology News

The Charter Schools Best Practices Project

COMMON CORE CALIFORNIA

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NSDL.org - National Science Digital Library

NSDL Home

Search

Search The National Science Digital Library

NSDL is the nation's online portal for education and research on learning in Science, Technology, Engineering, and Mathematics

Resources for K-12 Teachers

Math Common Core

Science Literacy Maps

NSDL News @ Tw

PBS LearningMedia

Welcome to PBS LearningMedia™, your new destination for trusted, classroom-ready, curriculum resources up for free to tag favorites, access standards-aligned digital resources, and more!

Browse Collection by Subject

Arts

English Language Arts

Health and Physical Education

Mathematics

Preschool

Professional Development

Science

Social Studies

Math Measures in the Kitchen and Out

2012 Teacup Innovator Award

Not just metadata...



- ▶ **Paradata: a particular kind of metadata.**
 - Specifically, paradata is usage data.
 - How is something being used?
- ▶ **Shared with Learning Registry based on activity streams specification**
 - actor, verb, object
- ▶ **Example:**
 - 10th grade English Languages Arts Educator (*actor*) matched academic standard Y (*verb*) with resource X (*object*)

NASA: here's metadata about a Mars Rover animation

CTE Online: new NASA animation: I'll show that metadata to my users

Teacher 1: this NASA animation "aligns" to this common core standard

CTE Online: here's social metadata ("aligned") for this NASA animation



NSDL: new NASA animation: I'll show that metadata and resource to my users

Teacher 2: I "like/+1" this NASA animation



NSDL: here's social metadata ("like") for this NASA animation

...

Service provider shares aggregate "like" data about each resource allowing teachers from different sites to share their opinions.

Service provider aggregates alignment data and uses it to make searches better

Service provider runs analytics on social metadata to provide advanced recommendations



Browse

- Status
- Released
 - Superseded

- Product Type
- API Technical Documentation
 - Air Force Joint Manual
 - Air Force Manual
 - Air Force Pamphlet
 - Air Force Tactics, Techniques,
 - Army Correspondence Course
 - Army Doctrine Publication
 - Army Doctrine Reference Public
 - Army Tactical Task
 - Army Tactics, Techniques, and
 - Army Techniques Publication
 - Army Warrior Training
 - Authenticated Drill
 - Authenticated Soldier Training I
 - Civilian Training Material
 - Collective Task
 - Common Core Training Support
 - Common Core Tsp Test
 - Comprehensive Soldier and Fam
 - Course Materials
 - 38 more...

- Proponent/Knowledge Center
- 011 - Aviation Center and Scho
 - 031 - CBRN School
 - 052 - Engineer School
 - 061 - Field Artillery School
 - 070 - Contracting and Acquisiti
 - 071 - Infantry School
 - 081 - Medical Department Cent
 - 091 - Ordnance Mechanical Mai
 - 093 - Ordnance Munitions and E
 - 101 - Quartermaster Center

Results: 0



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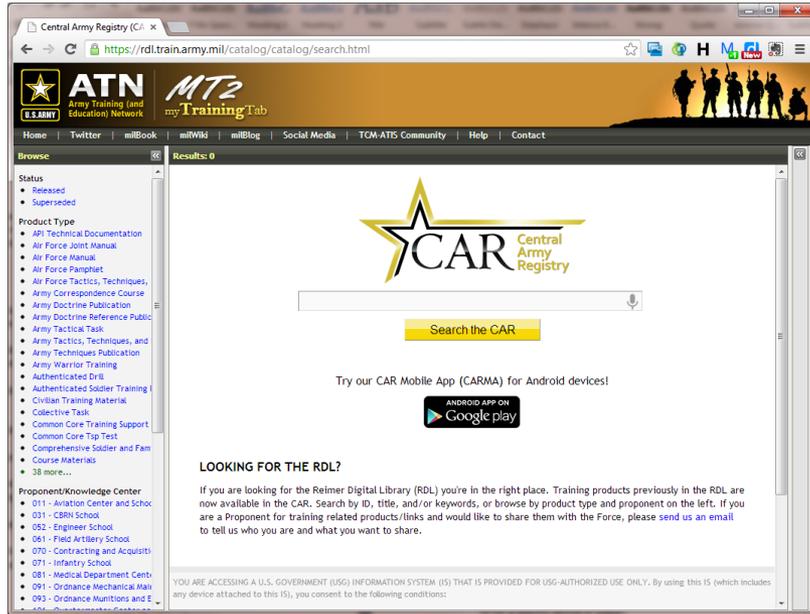
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Registry Integration



Exchanging public data through standardized services

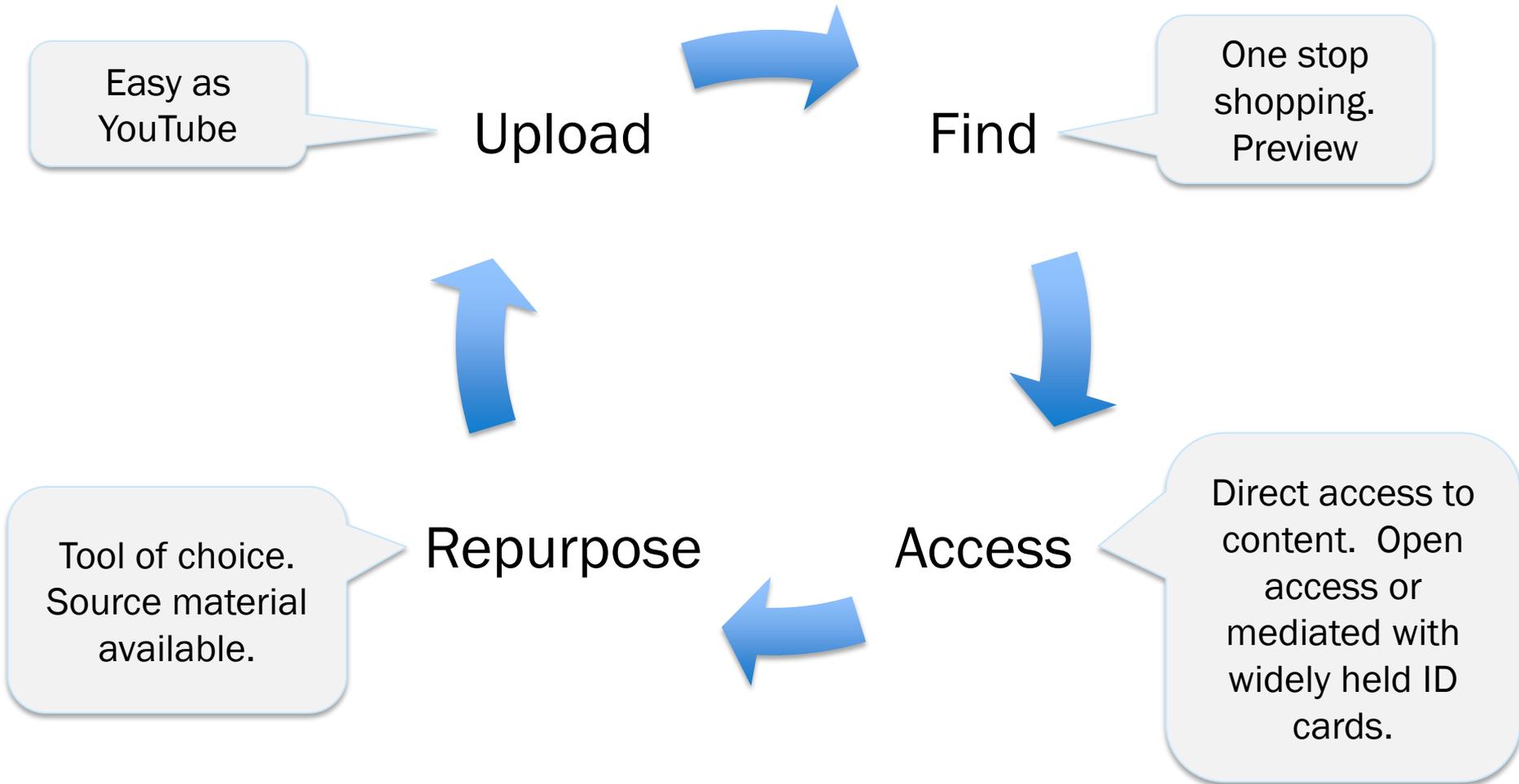
Repository Projects

Role of Content Repositories

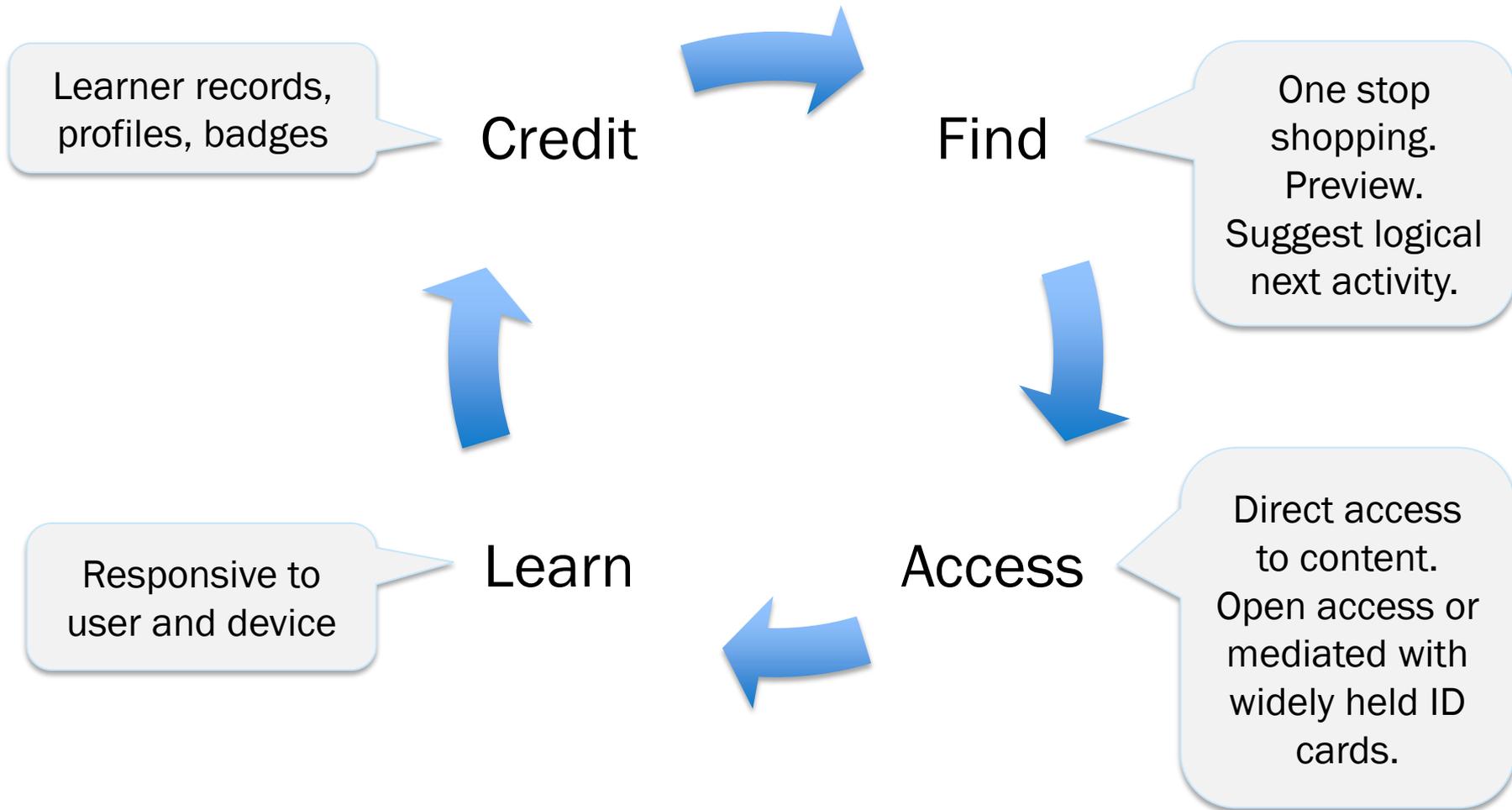


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Reuse Vision for Developers



Reuse Vision for Learners



Fork me on GitHub



3D Repository



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M939 truck with canvas back cover, desert paint sc...
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The sifter is made of electroplated nickel silver ...
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Tools

Upload Content	Collections	Projects	Groups	Account Settings	Manage Users
Repository Settings					

Recent Items

Edit Selected

Looking Ahead: The ADL Initiative in 2013	Adaptive Computer-Based Training in an ADL Context	Unity-SCORM Integration	Transmedia Principles	Next Generation SCORM Phase 2 - The Gap API	The Training and Learning Architecture: Meeting the Needs of the Next Generation of SCORM	The Experience API: Origin and Capabilities	Mobile Learning is Not Just Another Delivery Method
☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆
Looking Ahead at the ADL Initiative 2013	README.doc	Enabling Next-Generation Learning with the Next-Generation Learning Architecture	Metadata, Repositories, and Registries	SCORM Unity Kit	The Experience API: Origin and Capabilities	Mobile Learning is Not Just Another Delivery Method	Mobile Learning is Not Just Another Delivery Method
☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆

RUSSEL

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Workspace Collections **Projects**

New Design Project

Please choose an instructional design strategy for this project

- Gagne's Nine Events
- Modified Simulation Model

Cancel

New Project

v2's_test_pro... Click to edit	v1_test_proje... Click to edit	v5_test_proje... Click to edit	MS_Test_Sim... Click to edit	g1's_project.rpf Click to edit	DefaultName.... Click to edit	Another_Test... Click to edit
v3_chicken_... Click to edit	v4_test_proje... Click to edit	admin's_test... Click to edit	Naval_Aircraf... Click to edit	Golf_Lesson.rpf Click to edit	ADL_Test1.rpf Click to edit	Jefferson_Ins... Click to edit

[Click here to add a title](#)

Properties Export Update Cancel

Gagne's Nine Events

Select a section below to add content

Gain attention	Learning Objectives	Stimulate Recall	Present Content	Provide Guidance	Elicit Performance	Provide Feedback	Assess Performance	Enhance Retention
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Assets and Notes for **Provide Feedback**

Provide immediate feedback of students' performance to assess and facilitate learning. Types of feedback include: Confirmatory, Corrective, Remedial, Informative, and Analytical. Confirmatory feedback informs the student they did what he or she were supposed to do. Corrective feedback informs the student of the accuracy of their performance or response. Remedial feedback directs students in the right direction to find the correct answer, but does not provide the correct answer. Informative feedback provides information (new, different, additions, suggestions) to a student and confirms that you have been actively listening. Analytical feedback provides the student with suggestions, recommendations, and information for them to correct their performance.

	
Add Notes	Add Assets

- ▶ **Repositories and Registries are Emerging!**

- ▶ **Registries**
 - Focus on learner vision of reuse
 - Don't point to repurposing repositories

- ▶ **Repositories**
 - Focus on developer vision of reuse
 - Don't provide access to content that enables learners to get credit

Why is reuse more real now?



- ▶ **Leading indicators for e-learning reuse are software reuse and library reuse**
 - Software reuse was transformed by GitHub
 - Library reuse was transformed by Google Scholar

- ▶ **E-learning is next...**
 - Partnerships
 - Fiscal need
 - Open source, open content

Observations

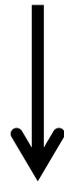
**Systems should be scalable,
but fast and easy to setup and use**

Systems should understand the content they are made for

Sharing **source code** through **GitHub** vs. sharing source code through SharePoint

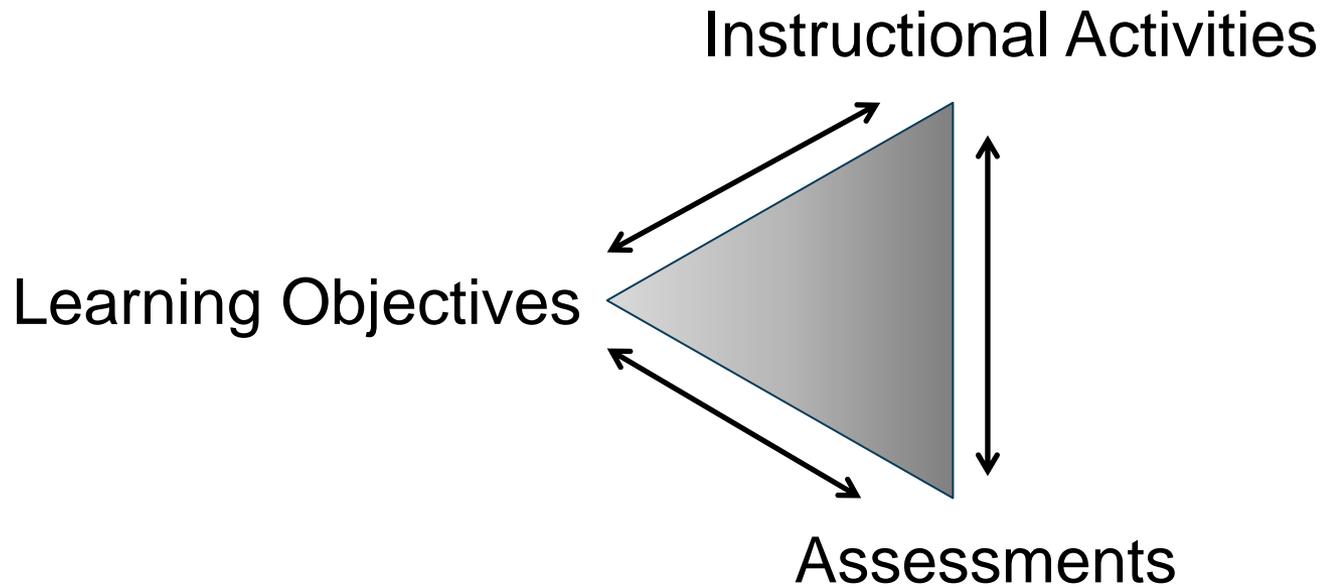
Sharing **office documents** through **SharePoint** vs. sharing office documents through GitHub

**Systems should support
humans and machines**



**learners (final media) and
content developers (source materials)**

Systems should associate content with objectives

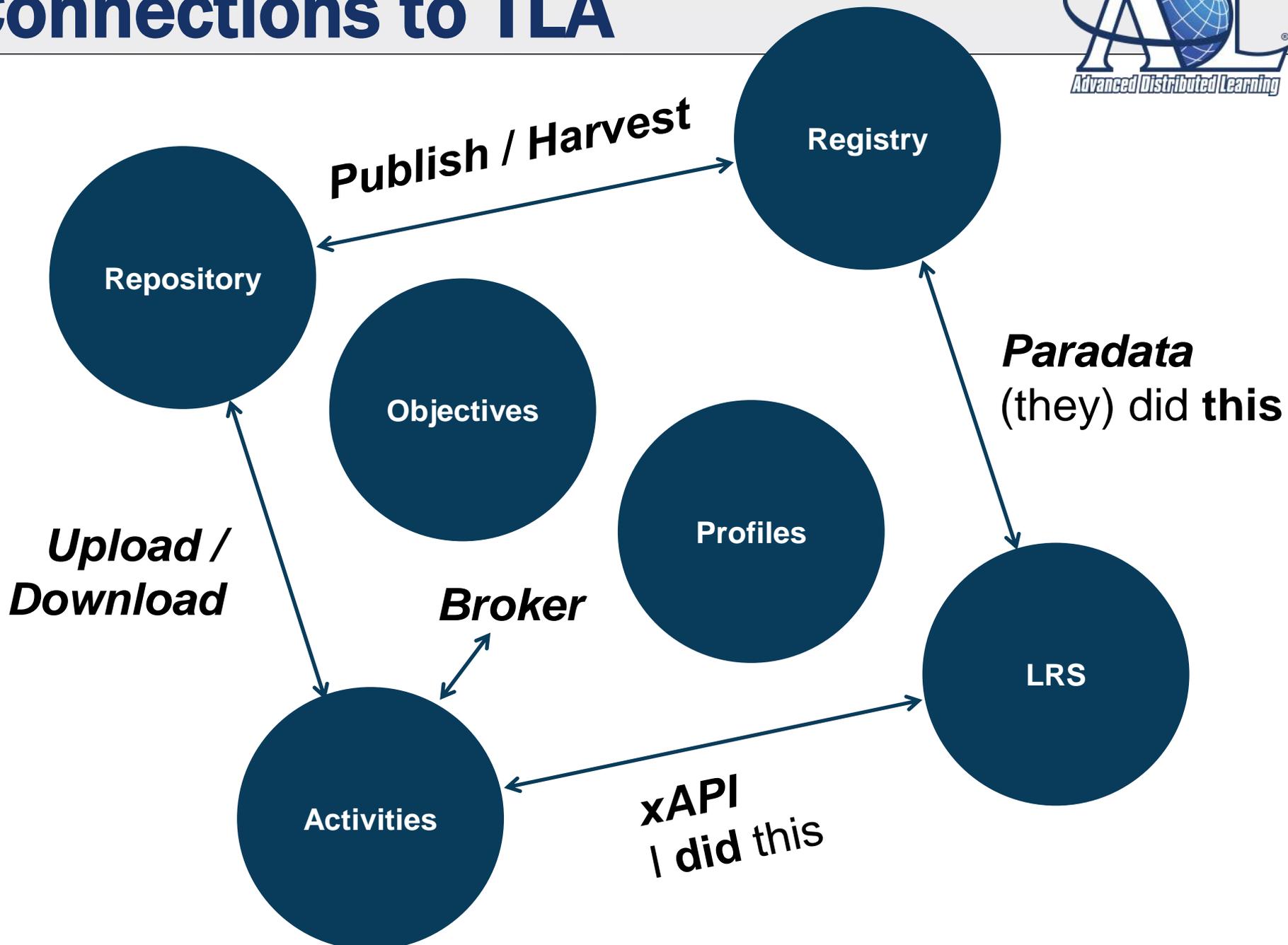


Metadata requirements should be minimal during upload

title, description, identity, rights,
objective alignment

schemas should be flexible

Connections to TLA



- ▶ **Responsibly reusing learning content should be easy for learners and content developers**
 - Important for systems to support users and machines
 - The time is right to enable the reuse of e-learning content

Questions?

Resources:

<http://www.adlnet.gov/webinars/reuse-and-content-brokering-webinar>

A close-up photograph of a person's hand holding a white rectangular business card. The hand is positioned on the left side of the card, with the thumb and index finger visible. The background is a soft, out-of-focus white and light blue gradient.

Damon Regan
damon.regan.ctr@adlnet.gov
407-208-5056