The Next Generation of SCORM: Innovation for the Global Force

Jonathan Poltrack, Problem Solutions
Jason Haag, Tolliver Group
Andy Johnson, Problem Solutions
Nikolaus Hruska, Problem Solutions

Advanced Distributed Learning

Background

- The Sharable Content Object Reference Model (SCORM) is the de-facto global learning standard
- SCORM is widely used in academia, industry, and government to create reusable, interoperable content
- More than 330 certified SCORM products
- Focuses on a single learner in a web-based training system
- Reports to a traditional Learning Management System (LMS)

Requirements Process

- We began gathering requirements for a new API to
  - Cover gaps in SCORM and
  - Enable new technological use cases
- "Project Tin Can" Broad Agency Announcement (BAA)
  - Interviewed eLearning community members
  - Reviewed of LETSI whitepapers (100+)
  - Crowdsourced feature requests (uservoice.com)
  - Prioritized and compiled use cases
- Defense ADL Working Group (DADL WG) feedback

Top Requirements

- Support out-of-browser learning activities with non-proprietary solutions (different content types)
- Enable offline, disconnected or intermittent connections
- Support distributed content and systems
- Connect value-added services for learning analytics to storage systems
- Define how stored data is retrieved in a consistent manner
- Update the communication mechanism
- Support social learning scenarios
- Make it simple!

Do we need a learning specification that expands on the capabilities of SCORM?

The Next Generation of SCORM

- **The “Training and Learning Architecture” (TLA)**
- **Leverages cloud computing and service-oriented architecture**
- **Modern software communication with learning systems via web services**
- **Tracks formal and informal learning scenarios**
- **Supports mobile devices, games, simulations, virtual worlds, and real-world experiences**

Goals for the TLA

- **Support the Global Force**
- **Leverage mobile devices, virtual worlds, simulations, and games**
- **Capture lifelong learning**
- **Enable a truly distributed learning environment**
- **Allow sharing of learning data across systems**
- **Deliver relevant content using Semantic Web technologies**

How will we start to meet these goals for our stakeholders?

Government, Industry and Academia

Social Learning

- **Social networks are online communities of shared interest (ex. Twitter)**
- **Learners develop a trusted “Personal Learning Network” via social media interactions**
- **Enables learners to look for knowledge outside their personal experience**
- **Learners can connect to experts, peers, and mentors for knowledge**
- **Traditional LMSs don’t track and record these social learning activities**

Activity Streams

- **The major social media companies developed the Activity Streams specification to capture social learning activities**
- **Format: "I Did This" - <actor> <verb> <object>**
  - **Activity Stream examples:**
    - **Jason *authored* I/ITSEC Paper**
    - **Jonathan *mentored* Jason**
    - **Andy *completed* CPR 101**
    - **Nikolaus *attended* I/ITSEC 2012**
- **Social networks provide "streams" of data**
- **Research shows Twitter streams being used effectively as an educational tool**
- **Instructors gain credibility from students when posting social or scholarly information**

Semantic Web

- **Activity Streams can be thought of as a triple**
  - **Ex. “Mark Twain wrote Huckleberry Finn”**
  - **Allows questions like “What other works did Mark Twain write?”**
- **Enable systems to infer information through the defined semantic relationships**
  - **Ex. recipes have prep time, calories, and ingredients**
  - **Ex. bank search gives phone #, directions, and a map**
- **Many available options to add rich semantic data to content**
  - **schema.org, microformats, microdata, Open Graph, META Tags**
- **GOAL: Systems can make meaning from the learner’s context to deliver relevant, related content through semantic analysis**

Looking to industry to set an example for Activity Streams

Activity Streams Industry Support

- **Google+, Twitter, Instagram**
  - **Ex. Nikolaus *liked* a photo**
  - **Ex. Jason *commented* on a photo**
- **Massively Multiplayer Online Games (MMOGs)**
  - **Ex. Andy *found* 86 Gold Coins**
- **Facebook "Open Graph" platform**
  - **Ex. Jonathan *read* the Odyssey**
- **ADL is representing the learning and training community**

How do we track such different data?

Experience API Features (“Tin Can API”)

- Comprises the first component of the TLA
- Stores all data in a Learning Record Store (LRS)
- Features an updated runtime communication method
- Allows reporting of Activity Streams from virtual, online, or real world activities
- Enables communication with out-of-browser content
- Allows flexible reporting and new data collection capabilities with a fully extensible architecture

Short Term Research Objectives

- **Complete Experience API Specification v1.0**
  - **Drive spec changes and features from community**
  - **Develop open source prototypes**
  - **Allow early adopters in commercial space to build support into their products**
  - **Move version 1.0 to standards body**
- **Support mobile learning!**
  - **Solve immediate needs of community to track mobile learning**
  - **Support both web and native mobile applications**
  - **Build reusable libraries**
  - **Prototype with the Services**

Long Term Objectives

- **Define domain-specific extensions for communities of practice**
  - **Ex. Medical, DoD, K-12 and Higher Education**
- **Support team-based learning, informal learning, and social learning**
- **Enable tools for roles other than learners**
  - **Ex. instructors, mentors, aides**
- **Let community build apps on top of the API**
  - **Ex. City of San Francisco public transportation**

Future Research Areas

- Learner profile technologies
- Just-in-time content brokering
- Intelligent tutoring
- Cognitive adaptability
- Improvement of retention
- Experiential learning
- Big data analytics
- Open independent learner models
- Semantic determination
- Application of virtual environments
- Social problem solving
- Self-directed learning

Questions?

- **Jonathan Poltrack**
  - jonathan.poltrack.ctr@adlnet.gov
- **Jason Haag**
  - jason.haag.ctr@adlnet.gov
- **Andy Johnson**
  - andy.johnson.ctr@adlnet.gov
- **Nikolaus Hruska**
  - nikolaus.hruska.ctr@adlnet.gov