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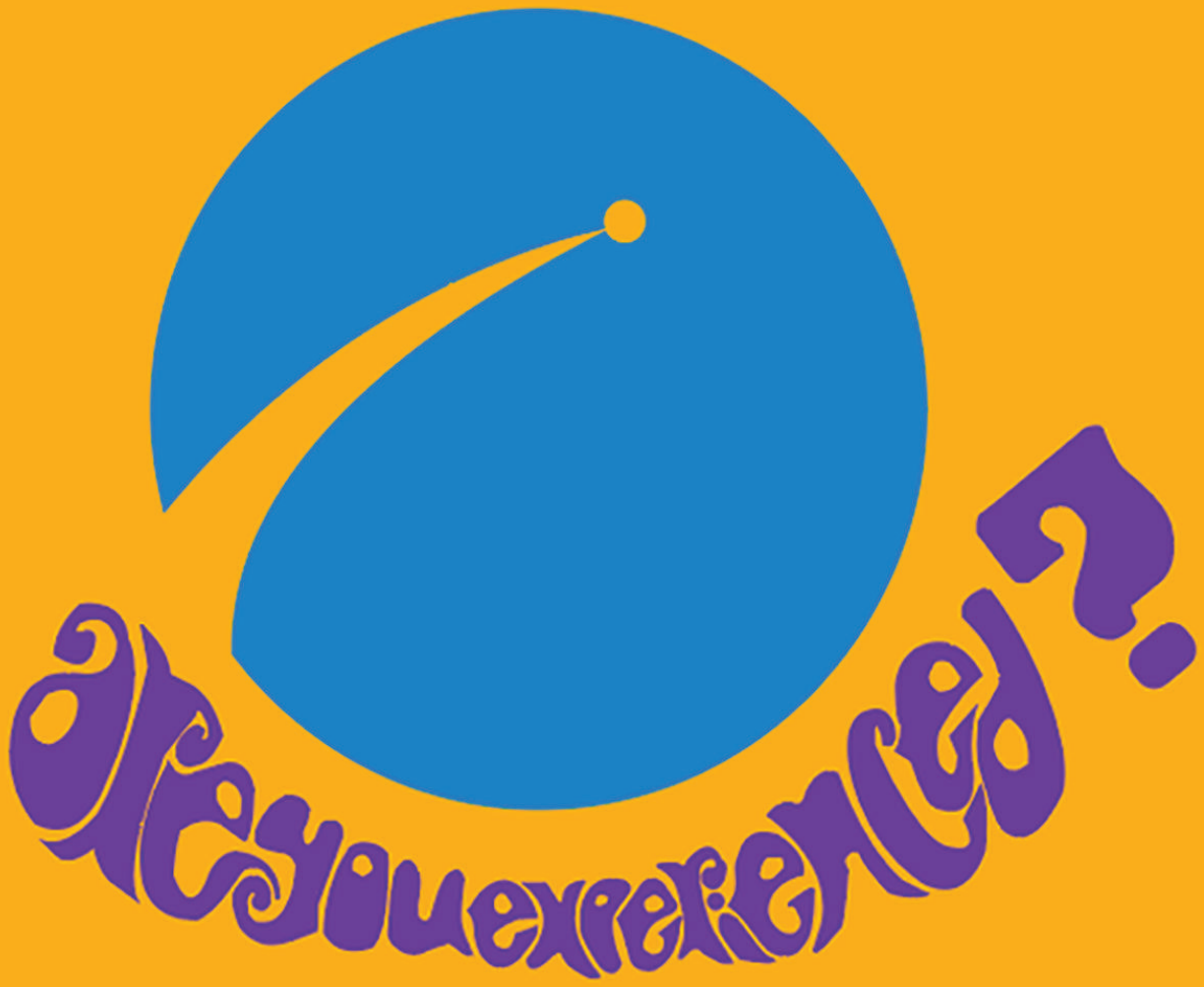
KNOWLEDGE SOLUTIONS

xAPI WHITE PAPER

IN STEREO

THE xAPI EXPERIENCE



MKS RECORDS

“With xAPI, you can begin to tie the details and specifics of your training and learning to your organization’s KPIs.”

- Paul Schneider, PhD, Senior VP, dominKnow Inc.

JUST WHAT IS THE EXPERIENCE API [XAPI]?

As defined by xAPI.com, the Experience API (or xAPI) is a new specification for learning technology that makes it possible to collect data about the wide range of experiences a person has during online and offline learning activities. It captures data in a consistent format about a person's or group's activities across many technologies. The varying systems securely communicate by capturing and sharing this stream of activities using xAPI's simple vocabulary.[1]

A BRIEF HISTORY

xAPI is widely viewed as the next generation in an evolving set of standards governing the development, delivery and evaluation of learning content. The first set of widely adopted guidelines were produced by the Aviation Industry Computer-Based Training Committee (AICC), an international association of technology-based training professionals that existed from 1988 to 2014.[2] The aviation industry was the driving force behind AICC, with the goal to address concerns from airlines about cost issues arising from the proliferation of PC-based training materials that were mainstream at the time.

AICC specifications were typically designed to be general-purpose instead of specific only to the aviation industry. However, as training was delivered on computers and via networks, and the internet became ever more common, other challenges began to increase cost concerns. Fast-forward a decade and in early 1999, President Bill Clinton signed Executive Order (EO) 13111, establishing a Federal Government Task Force to develop and recommend policy to promote and integrate the effective use of training technologies to create affordable and convenient training opportunities for Federal employees.[3] EO 13111 designated the Department of Defense to lead Federal participation in the development of "consensus standards" for training software in collaboration with business and postsecondary education. This effort led to the formation of the DoD Advanced Distributed Learning (ADL) Initiative. The consensus standard developed was named the Shareable Content Object Reference Model (SCORM).

Despite the lofty language of EOs, the main motivation behind SCORM in the 1990s was cost containment/reduction by the Federal Government; just as cost was a driver for AICC in the 1980s for the airline industry. The Federal government was spending increased amounts of money on technology-based learning that was not portable across learning delivery systems and could not be easily reused. Therefore, SCORM promised a model where one could create units of online training material, called shareable content objects (SCOs), that could be shared across systems and reused in different systems and contexts.

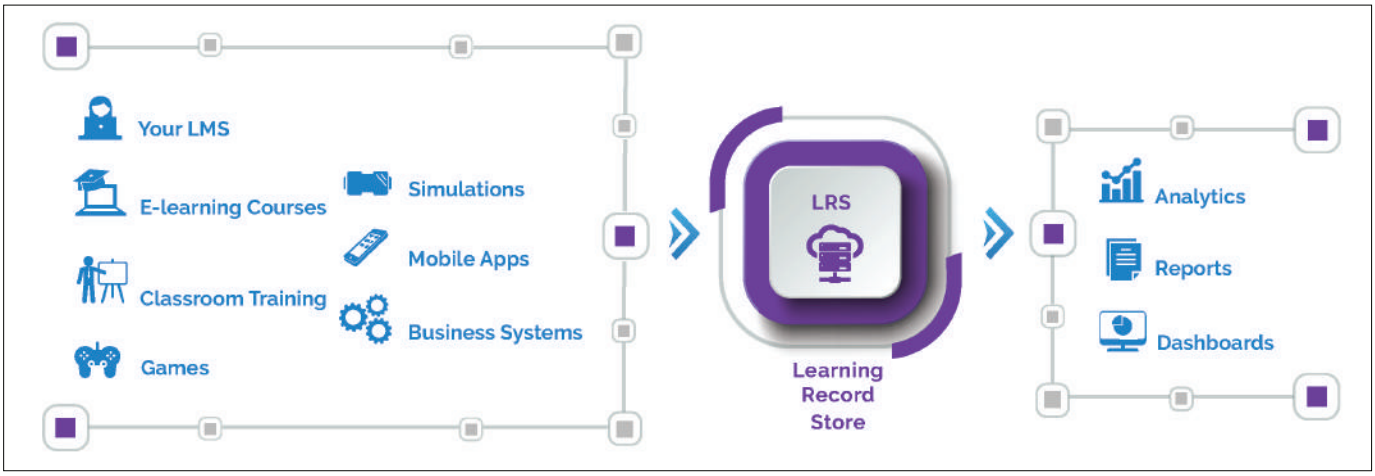
"Reference Model" reflects the fact that SCORM isn't a standard.[4] ADL decided to leverage multiple existing industry standards,

[1] xAPI.com - https://xapi.com/overview/
[2] Wikipedia - https://en.wikipedia.org/wiki/Aviation_Industry_Computer-Based_Training_Committee
[3] EXECUTIVE ORDER 13111 - https://archive.opm.gov/pressrel/1999/eo.htm
[4] SCORM.com - https://scorm.com/scorm-explained/

including AICC, and provided a framework for developers to use them together. AICC and SCORM went through multiple major iterations. xAPI is widely considered the "next generation of SCORM" and is the newest learning standard. In 2014, the AICC formally transferred their latest AICC efforts named CMI-5 to ADL and dissolved. ADL is currently managing xAPI, so now all three major technology enabled learning standards are overseen by the same program.

One key difference with the origin story of xAPI is that cost savings was NOT one of the major drivers behind its creation. xAPI is all about expanding capabilities – specifically capabilities to track learning that takes place everywhere.

ADL is not the only learning technology standards body with global reach and impact. The IMS Global Learning Consortium's mission is to advance technology that can affordably scale and improve educational participation and attainment.[5] IMS began as a project within EDUCAUSE. the leading voice for post-secondary education technology. IMS Global started within higher ed, but now covers requirements across K-12, corporate and government. While ADL is primarily focused with content standards and tracking learning, IMS standards focus on reducing costs via standards-based integration amongst a wide range of learning systems and tools.



"I DID THIS..."

Prior to xAPI, we could only track, in a non-proprietary way, what a learner did in a traditional e-learning course delivered in a traditional SCORM compliant learning management system (LMS) and rendered in a traditional SCORM content player.

xAPI has the potential to change how learning is tracked for generations. There are only two key elements within the xAPI specification: statements and the Learning Record Store (LRS). Statements dictate the format for specific learning activities and follow an "[actor] [verb] [object]" structure. The LRS is where xAPI statements are stored and its portion of the spec defines the communication method for sending, receiving and requesting data. [6]

The statements using nouns, verbs and objects lets you record almost any activity in an LRS, think "I did this." Furthermore, xAPI includes rules that define how LRSs can share data with other LRSs and an LRS can live on any device/OS and connectivity is not required.

5 IMSGLOBAL.org - http://www.imsglobal.org/aboutims.html
6 xAPI.com - http://bit.ly/xAPI_xAPIHomepage

xAPI compliant solutions can track learning everywhere it happens, whether online or offline. Guillermo Miranda, the current CLO of IBM, describes the learning architecture of today like digital marketing, it embraces many types of content, collects data on interactions and activities, uses intelligent systems to promote content and monitor employee usage, and is personalized for everyone.[7]

TO BE, OR NOT TO BE [XAPI], THAT IS THE QUESTION

The driving force behind the dominant eLearning standards initiatives has been cost savings. The thinking was, "We are spending all this money on learning content and we need to track it. We also need to be able to share and reuse it." This made adoption of AICC and SCORM straightforward. "I need SCORM and/or AICC compliant content to be delivered in a SCORM and/or AICC compliant LMSs." Case closed.

In practice, deploying SCORM content was not that straightforward, but in theory it wasn't too hard to understand the value propositions of AICC and SCORM. For better or worse, xAPI is not as straightforward, it and often creates more questions than it answers, such as:

- **What type of data to collect?**
- **Which learning experiences to track?**
- **Which systems to pull data from?**
- **Which systems to import data to?**
- **What am I going to do with all this data?**

The answers to these questions will vary greatly, with each organization making unique decisions regarding how, when and where to best exploit xAPI. Learning technologist Mike Rustici, the proclaimed father of xAPI, likes to talk about the "freedoms" of xAPI.

The freedoms of the Experience API

- Statement freedom: the structure of "statements" using nouns, verbs and objects lets you record almost any activity. Think: "I did this."
- History freedom: the xAPI allows LRSs to talk to each other. LRSs can share data and transcripts with one another and your experiences can follow you from one LRS (or organization) to Learners can even have their own "personal data lockers" with their personal learning information inside them.

7 Josh Bersin, The Disruption of Digital Learning: Then Things We Have Learned, updated August 14, 2019

- Device freedom: any enabled device can send xAPI statements (mobile phones, simulations, games, a CPR dummy, the list goes on). A constant network connection isn't necessary — occasional connectivity is fine.
- Workflow freedom: tracking learning events doesn't have to start or end in an LMS, it can start wherever the learner is, on any device, as the content isn't tied to an LMS.[8]

But with freedom comes choices. And it is ultimately up to each individual, department, agency, institution, or organization to make good choices about where to use xAPI to get the biggest bang for the buck. The sections that follow include several use cases to highlight the potential for xAPI. Your "experience" will vary. We conclude with a simple framework you can use to start your xAPI journey, and a brief overview of the Meridian LMS xAPI support and capabilities.

EXAMPLE 1 – TRACKING BLENDED LEARNING

Tracking blended learning solutions is challenging, because the components may be a mix of in-person, online, self-paced, and on-the-job learning—and anywhere in between. Imagine a blended learning approach to teach staff how to react during an active shooter situation. The first part of the blended experience is a traditional e-learning course that covers the use and placement of safety equipment and resources; the second part is a mock scenario that uses actual people in a field setting. The eLearning course can use xAPI to track specifically how learners navigate through the e-learning course, what content is or is not accessed, and assessment scores on equipment and resource placement. Likewise, the real-life simulation can use an xAPI-enabled web application, completed by an observer, to rate learners on their performance during the simulation.

As both pieces of the blended learning scenario are tracked using xAPI, the complete set of data can be tied together and visualized in a dashboard or report. This enables consistent monitoring and evaluation of staff performance across related learning interactions and practice.

EXAMPLE 2 – IDENTIFYING FAILURE POINTS

During a simulation or scenario-based e-learning course, a failure point is where a learner begins giving incorrect answers, asking the wrong questions, or taking the wrong actions.

For example, let's say a course is designed to simulate a crisis where the learner can identify people to interview and how to interact with them. The scenario allows the learner to ask questions that are not correct and also presents opportunities to ask better questions and get back on track throughout the scenario.

Using xAPI, you can track how the learner navigates through the content. You can answer specific questions such as:

How many times did learners ask not-so-good questions before they figured out the right question?

8 xAPI.com - https://xapi.com/overview/

Did learners ultimately take the best path, or did they continue asking questions that were not productive? Without xAPI, you would not have access to this granular data to illustrate paths that were taken by learners.

EXAMPLE 3 – CAPTURING OFFLINE DATA

What happens when you design an e-learning module that will be deployed to a group that does not have consistent access to the Internet? With previous standards, there was no way to consistently gather data in an offline mode. Now, when planning for offline access, you can use xAPI to store data on a local machine and then sync with the server when the machine does have a proper connection.

The data is time-stamped when the action is performed and when it is written to the server. Once the data syncs to the server, you can build visualizations and dashboards from the information collected and conduct further analysis and reporting of the offline experiences.

THE MERIDIAN LMS AND XAPI

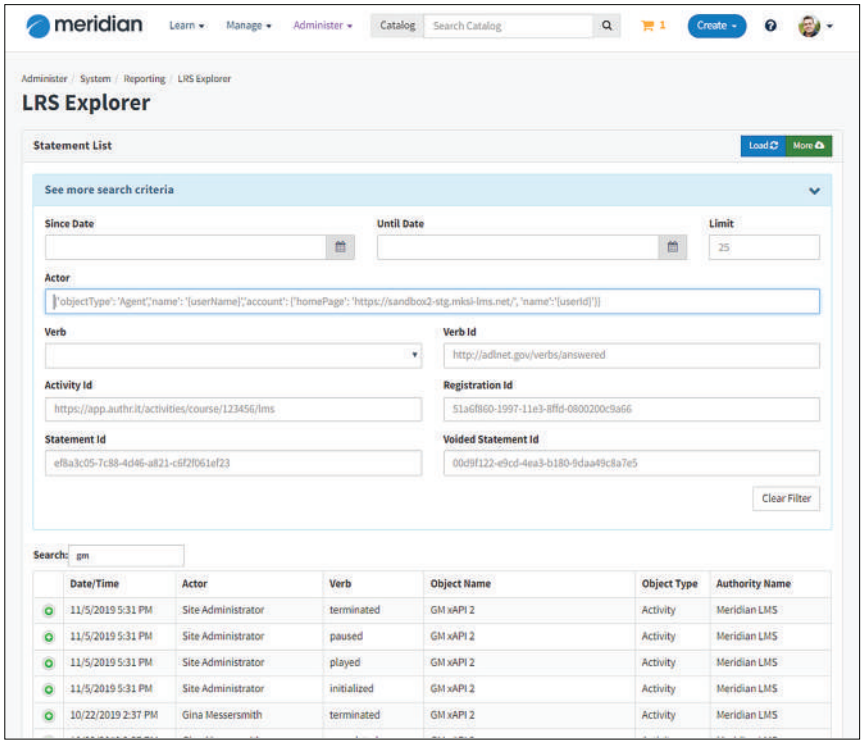
xAPI Needs an Ecosystem

Adopting xAPI requires an LRS and xAPI-compliant content at a minimum. From a practical standpoint, it usually requires a workspace from which learners can find and access this content, and that workspace is generally the LMS. The LMS can not only provide catalog, search, and recommendation functionality, but authentication as well. The LMS also contains valuable user data that is not sent via xAPI statements but can be correlated based upon a common identifier.

Meridian LRS

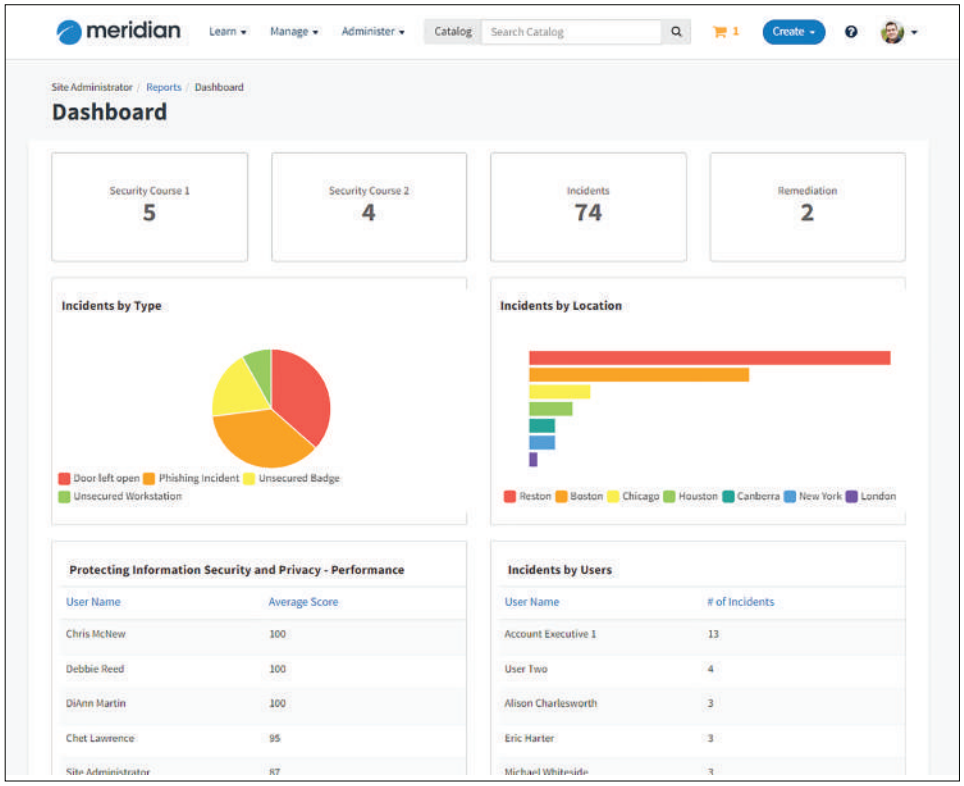
Meridian is the only ADL-conformant LRS on the market that is built as part of an LMS offering. It will accept, send and store xAPI statements generated from within or outside of the LMS entirely.

Meridian's LRS Explorer allows an administrator to view and search all statements that have been captured by the LMS. Results are presented in a simple tabular Entity/Verb/Object format, but each row can be expanded to show the entire statement so administrators can see exactly what information is being passed and in what format.



Furthermore, it's common for large organizations to have multiple systems for the same purpose. Some of these are repetitive and highly specialized. Sharing data between learning management systems is complicated due to each LMS storing their user, course, and progress data in different ways. As a result, the data in each system is often siloed.

On the other hand, an LRS, by definition, stores its data in the same manner as another LRS. This means that it can be shared between LRSs more easily. To that end, Meridian supports Statement Forwarding, which means that xAPI statements that are sent to the Meridian LRS can be automatically sent to another LRS. Recognizing that an organization may want to be more targeted, and only forward certain types of statements, Meridian allows forwarding rules to be applied, which may target specific actors or content items, or verbs.



Of course, while Meridian also allows organizations to plug their own LRS directly into the LMS (bypassing Meridian LRS), our recommendation would be to use the Meridian LRS directly and simply forward all statements to the second LRS, thus ensuring both places have all statements.

A WORD ON REPORTING

Given the wide range of possible statements and contexts that can be captured by the LRS, one-size-fits-all reporting can be a challenge. Providing insight into LRS data is only part of the picture. Correlating with additional data is quite often where the real value is found.

To that end, Meridian specialists recommend working backward from the end goal and being clear about the questions the data should be able to answer. The Meridian team can help recommend and implement the exact report or dashboard for an organization's needs.

xAPI CONTENT

While xAPI statements don't necessarily have to be content-based, there are numerous advantages to tracking more granular data with xAPI. How long did the learner spend on each page? How many decided to view the optional information on page 6? Meridian allows for the integration of a variety of xAPI-based content.

- **Link to an existing course.** Create a content object in the LMS that references to an external xAPI-compliant item.
- **Create a course.** Use the integrated dominKnow Claro platform to create a course, format it as xAPI, and go further by creating custom xAPI-specific actions.
- **Add a video.** Uploading or linking to a video when creating a General Course in the LMS means the Meridian Content Player will send xAPI statements around initialization, seeking, pausing, completion, and more.

CONCLUSION

While usage of xAPI is still emerging, the specification is already battle-tested. Failure to leverage xAPI at this point is a failure of imagination, as the sky is the limit in terms of its potential applications. Prior to xAPI, such solutions would require a great deal of custom development, backend access to proprietary systems and lots of time, money and resources to deliver and maintain solutions over time.

xAPI mitigates all of these challenges and opens up a new world of possibilities when it comes to tracking learning and the learning process. xAPI gives everyone a non-proprietary way to make the critical details of learning more available to the right people and the right systems at the right time. xAPI makes previously hidden data more actionable, thus making it easier to align limited resources to meet business objectives and achieve mission success.

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KNOWLEDGE SOLUTIONS

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