Using the Experience API to Track Learning

by John Delano and Ali Shahrazad
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The majority of employee learning happens during unstructured on-the-job experiences, social interactions, and through use of informal learning sources, with minimal interaction or insight from learning and development organizations. In other words, learning just isn’t happening through a formal e-learning course.

Today’s workforce uses a proliferation of information available on demand, social learning tools (such as Yammer, Jive, and Google Chat), and third-party training programs (such as SkillSoft, Khan Academy, Coursera). Organizations need to increase involvement in unstructured learning across these multiple tools.

However, the challenge of tracking and aggregating all of this learning in a consistent, reliable way remains. The Experience API (referred to as “xAPI,” and also known as the “Tin Can API”) is an e-learning software specification that allows learning content and systems to speak to each other in a manner that records and tracks all types of learning experiences. These learning experiences are stored in a Learning Record Store (LRS), which may exist in a traditional Learning Management System (LMS), or on their own (installed or web-based). The Experience API does not require a learning experience to take place in any particular medium (mobile, desktop, tablet), offline or online, or in any particular system.

This Infoline will explain how and why the xAPI emerged as the next-generation learning standard. You will learn about the history of the xAPI, how to implement it in your organization, its benefits and challenges, how to select appropriate training systems, how to assess your organizational readiness, and form a high-level technical understanding of this e-learning technology standard. You will discover applications and use cases to help you solve problems you are experiencing in learning and development, and find new ways to support learning experiences that lead to improved organizational performance. The evolution of workplace learning has begun and xAPI will be the key enabler for learning organizations in this decade.

This Infoline uses a number of terms that you may not be familiar with; please see the Glossary at the end of this issue.

**EVOLUTION OF E-LEARNING**

When e-learning was still in its (relative) infancy, the Sharable Content Object Reference Model (SCORM) was created to allow online learning content and Learning Management Systems (LMS) to communicate with each other. Following the SCORM standards ensures that e-learning courses and LMSs work together. But learning is changing and the current model of the SCORM standard has reached its limits. Fortunately, with the introduction of the xAPI standard, learning organizations now have the ability to aggregate, visualize, and analyze both structured and unstructured learning data that has been previously unattainable, enabling organizations to reduce costs, increase employee effectiveness, and connect learning activities to performance.

The xAPI necessitates the use of a new system, the Learning Record Store (LRS). LRS was developed specifically to work with the xAPI. We’ll cover these systems in more detail in the next section.

**WHAT IS A LEARNING RECORD STORE?**

A new and central component of the xAPI ecosystem is the Learning Record Store (LRS). This is the central repository where all statements (data) about learning experiences are stored. The statements or records are in the form of “actor-verb-object.” For example, “Jonathan attended a mobile learning webinar” or “Betty read a T+D article.” These statements are transmitted to and stored in the LRS, which can live inside of a traditional LMS or on its own. LRSs allow for in-depth reporting and analytics on learning activities.

The LRS is responsible for a) validating that the system sending data is authorized, b) checking that the data being sent is xAPI-compliant, c) storing the data properly, and d) making that data available to any other authorized system or activity provider when asked. Since xAPI-enabled learning experiences are not required to be launched from an LMS, the recorded details and data (statements) from an activity need to be stored somewhere—and this is why an LRS is necessary.
BENEFITS AND CHALLENGES OF THE xAPI

While the xAPI allows learning and development professionals to design learning experiences in a more flexible and progressive manner, it also introduces some important challenges and design considerations.

Benefits of the xAPI

• **Tracks learning everywhere.** The xAPI doesn’t care where learning takes place. No constant connection to a particular system or even to the Internet is required to track and report activities and experiences. It doesn’t matter what device somebody used or if the learning happened offline or outside the classroom. Actual performance and tasks completed in the normal flow of work can now be easily tracked using the single technology standard.

• **Fits with existing systems.** Existing engagement or record systems can be programmed to report experiences to an LRS using the xAPI. Additionally, it has been very easy for training tool vendors to incorporate the xAPI into their products (over 40 vendors have adopted it already).

• **Portable data.** The xAPI makes reported data extremely portable. An LRS is required to store data and make it available to any authorized provider or requestor. Data can easily be ported and shared with other LRSs or similar systems.

• **Learner-centric.** The learner is at the center of all experiences and activities reported; not a course, which is the case for SCORM-enabled reporting.

• **Flexible reporting.** The xAPI allows for reporting granularity and detail, and with this comes the obligation of filtering data to retain only those items that are important. The xAPI is extremely flexible in allowing the designer to decide how much detail should be reported about a learning experience. If the designer uses the proper discretion, the data we have becomes more valuable. It provides us with more insight than just a declaration of course completion and a score.

Challenges of the xAPI

• **Security and Privacy.** The xAPI gives us unprecedented abilities to gather intricate details about what and how people are learning. There are currently concerns about learners’ privacy and gathering data from multiple sources without their authorization. Who owns the data? How is it secured? Does the responsibility fall on the organization or the reporting tools and activity providers to protect that data?

• **Data Granularity.** The benefit of having the ability to track more detailed information about learning also introduces a new challenge. How much is too much? It is important that as designers and developers embrace the xAPI and all its power, they also understand how to avoid collecting useless and inoperative data about learning.

• **Verbs and Activities.** An important design consideration is the selection and use of verbs in an xAPI statement. Organizations and communities of practices must maintain and share repositories of verbs along with their definition or context. “Firing” an employee is very different from “firing” a rocket. “Experience” is a vague verb with a very broad meaning. The flexibility of the xAPI exposes the need for skilled and conscientious design.

• **Scalability and Conformance.** Over time, more systems will be generating increasing volumes of xAPI data. Organizations will need to carefully select LRSs that can scale to meet the demands of data storage and processing. System conformance to new and older versions of the xAPI standard will be more important than conformance with SCORM.

• **Reporting Tools.** So we have all this data and need to make sense of it. The responsibility for analysis and visualization of learning data will be on training tool vendors, IT consultants, or the learning and development function. Correlations between different types of data need to be established from very flexibly created data structures.

• **IT Partnership.** Tracking learning that originates outside the Learning Management System requires us to tinker with non-traditional learning systems like SharePoint, Yammer, WordPress, Content Management Systems, and
HR management and information systems. It will be imperative to partner with IT teams to enable data-sharing between different systems and stakeholders using the xAPI.

As the learning and development community designs more learning experiences using the xAPI and an increasing number of use cases are realized, the standard will evolve. Throughout this process, tool vendors and xAPI-specification contributors will listen and learn, and ultimately respond to the needs of the community. There are many ways to get involved and learn more about this iterative process.

LEVERAGING THE xAPI

Let’s take a look at a scenario that illustrates practical ways in which the xAPI can be leveraged.

Acme Company is launching version two of its flagship product. L&D needs to train the sales force on the product’s new features and competitive advantages for product launch in conjunction with an upcoming industry conference.

Sales force readiness is critical to gain early market share, so L&D creates a 30-minute web-based training program with supporting product documentation and loads it in the LMS and SharePoint respectively. Employees take the mandatory training within the LMS and L&D receives reporting on completion of the training module. L&D involvement ends here.

Employees, however, continue their informal learning through social tools (Yammer, YouTube) and interaction with peers while getting back to “real work.” They update funnels in SalesForce.com and find competitive product reviews on the Internet for use in upcoming meetings with customers.

As a result, L&D has an incomplete view of employee learning, competencies, and success metrics. Data collected is limited to module completion and score, but no data outside the LMS is available to analyze and take action on. L&D sends completions and scores to leadership and moves on to the next training project, offering little to no active performance support for employees.

How would the above scenario be different with the xAPI? This time L&D is actively engaged in performance support. In addition to creating a five-minute web-based training program and product documentation for the LMS and SharePoint (similar to before), L&D aggregates data from tools employees are using throughout their day [such as Yammer, Salesforce.com, and SharePoint] for analysis.

Through data analysis, L&D finds that Yammer discussions indicate confusion about the durability of the new product, with references to a side-by-side product review web article. Additionally, they see that only two SharePoint reference materials are being used consistently and the majority of new opportunities in SalesForce.com are well below forecast.

In response, L&D jumps into the Yammer conversations with answers to the durability questions, provides links to a PDF on durability and a favorable web article, and updates the other documents not being accessed in SharePoint. To address the low numbers in Salesforce.com, they post a user-generated video in Yammer from a top salesperson that details specific market opportunities for the product.

Other Scenarios That Leverage the xAPI

Scenario A: Third-Party Course Offerings
Situation: To save costs, the learning department chooses to use courses from third-party vendors for training on commonly-used skills across the organization.

Challenge: These courses are not in their learning management systems (LMS) so reporting is manual and limited to completion of the courses.

Requirements: Automatically transfer and store data from third-party training without seeking a customized solution from IT.

Solution: The learning department chooses a third-party vendor that is xAPI-compliant and imports xAPI learning data into the LMS for employee reporting. The LMS includes an LRS and is enabled to receive xAPI statements.

Result: The learning department is able to show...
Using the Experience API to Track Learning

The last e-learning standard created over 10 years ago (SCORM), and still used today, is a collection of standards for web-based learning that defines communication between content and something called a run-time environment. As more people start learning on mobile devices and in systems outside the LMS run-time environment, they turn to xAPI to solve many of the problems inherent in SCORM.

The xAPI is an extremely flexible and extensible learning technology standard. It defines how systems describe and communicate what people do in a consistent fashion. This could be learning-related or not.

Software clients implementing the xAPI can read and write data in the form of statement objects, which are structured JSON objects. JSON is a text-based open standard for human-readable data interchange. A statement in its simplest form contains information about an “actor,” a “verb,” and an “object”—for example “Jane read Food-Handling Safety Manual.” A statement can also take more complex forms to include metadata such as results, scores, groupings, context, instructor/team information, platform, language, even GPS coordinates and images.

An actor can be identified by an email address (or a hash of it), an account name (such as a Twitter handle) or an OpenID. A verb defines what the action is between an actor and an object or activity, and its semantics must be identified at a verb Uniform Resource Identifier (URI). An example of why this is useful and necessary is when the verb “fired” is used. “Fired” could mean the action of firing a weapon or firing an employee, so the use of a URI clarifies the meaning. The xAPI is not constricted to the use of a specific set of verbs, but instead defines how they should be used. The object is most likely an activity, another agent/actor, or another statement. An activity is also identified by a unique URI.

Once a statement is triggered by a system event, it is transmitted over HTTP or HTTPS to a Learning Record Store (LRS) to be recorded and later queried as needed (an LRS can reside in an LMS or stand alone). An LRS provides Basic Auth or OAuth credentials for the activity provider or software client; it validates the statements that it receives to ensure they are well-formed and compliant with the xAPI specification, and finally stores them (or returns an appropriate error code). If a statement is sent to an LRS without an ID, the LRS assigns it a unique ID (known as a UUID). Statements that are stored in an LRS are immutable; this means that they cannot be changed, but can be deleted only if an authenticated activity provider voids them. Statements can also be sent to multiple LRSs at once or shared between LRSs if authorized, which truly makes learning data portable and free from the confines of a closed database. The recorded statements can be filtered and requested back from the LRS using the built-in Query API. There is also a State API that acts as a scratch space for consuming applications.

The data is stored in a structured yet flexible format that allows for many more data points with a lot more context than ever possible using the SCORM standard. The analysis of learning becomes more realistic, useful, and real-time using the xAPI. The amount, granularity, and use of xAPI-generated data should be carefully considered during design and implementation to ensure that there are clear benefits to the learner and the organization without compromising user/agent security and privacy.
not only a reduction in cost by using a third-party vendor; they were also able to include information in employee profiles for career planning purposes.

**Scenario B: Employee Onboarding**

Situation: The learning department is implementing a new onboarding program for employees. The onboarding program uses a combination of micro-learning videos, product documents, and assignments.

Challenge: The current LMS does not include a user-friendly chat or video client nor does it have an LRS to capture xAPI data. There are no planned upgrades for the LMS in the near future.

Requirements: Use existing tools within the employee workflow to deliver the new onboarding program. The learning organization must be able to capture learning data from these tools for analysis and reporting.

Solution: The learning organization chooses to host the onboarding program content in SharePoint and Yammer, the two most-frequented employee tools for accessing learning content. They choose an independent LRS to aggregate, analyze, and make recommendations from employee learning data. The independent LRS allows them flexibility to interact with a future xAPI-compatible LMS. Because SharePoint and Yammer do not produce xAPI statements, they easily install SharePoint and Yammer connectors (plug-ins) to convert data to xAPI standards and send to the independent LRS.

Result: The learning organization was able to identify common areas of misunderstanding from within the Yammer community and replace less effective SharePoint content. They were also able to identify “influencers” in the community to assist in training new employees, reducing employee onboarding time and costs.

**Scenario C: Mobile Learning Game**

Situation: The learning organization would like to increase the use of mobile games for training employees on how to properly store chemicals in a warehouse. Though the topic is extremely serious, early mobile game pilots have shown an increase in participation and a decrease in storage mistakes by the pilot groups. They contracted with outside vendors to create a series of mobile learning games for employees’ continuing education.

Challenge: Data aggregation from multiple mobile game vendors is unavailable for analysis; there is no way to find common mistakes, trends, and make personalized recommendations.

Requirements: Aggregate and visualize data from mobile games and other e-learning tools into a single location to identify areas of risk.

Solution: The learning organization designs all mobile games to be xAPI-compliant so the data can be aggregated in a LRS.

Result: Employee participation increased; armed with additional data, the learning organization partnered with the safety committee for targeted training and warehouse changes, reducing overall risk.

See the sidebars *Certification and Performance Support Use Case* and *Environment Model Use Case* for more examples of the use of xAPI.

**ASSESSING L&D READINESS**

Is your L&D function ready for the xAPI? Question whether the department is displeased with:

- what you currently know about employee effectiveness and performance, based on the effort and money you put into creating and deploying training
- the fact that you have little knowledge and understanding of what is being learned in the natural workflow of your internal customers
- the way technology is hindering your ability to support and understand learning and development in your organization.

If you are not displeased with these factors or are comfortable with the way things are, the xAPI may not be worth your time and resources. Take some time to assess whether your organization is ready to make use of the new xAPI technology standard. This includes looking into design tools and systems, employee adoption, and leadership readiness.
CERTIFICATION & PERFORMANCE SUPPORT USE CASE

(The following sidebar was contributed by Megan Bowe and Jeffery Horne. Used with permission.)

Imagine that Adam was just hired as a forklift driver in a warehouse and one of the first things he needs to do is get his forklift certification. In a traditional certification program, Adam would undergo training, take a written test, undergo a real-world operating evaluation, and then be given his certification. In an xAPI-enabled system, however, the level of detail about Adam’s learning is expanded. Many parts of the training can be automatically tracked and stored in an LRS. For example, when Adam uses a digital safety checklist before operating the forklift, his use of the document can be tracked. The answers to his tests are collected, along with the outcome of the test. Practicing operating the forklift can be tracked, too. The forklift can be equipped with sensors that track how he is using the controls. The forklift’s computer can track how long he practiced with the forklift. Adam can play a video game in which he learns where the controls of the forklift are located, and how to operate them. Every step of the game and Adam’s performance in it can be tracked.

Perhaps the best part is that even after Adam’s training is over, his real-world job performance can be tracked. The xAPI can be tied in to the warehouse’s inventory system, and it can log whenever Adam loads or unloads a pallet. Supervisors can begin tying training to real-world performance and answering questions about training that they could not easily answer before. This is made even easier because all this xAPI data lives in one place, and in one format, inside an LRS.

Refer to the table on the next page to see Adam’s story told with xAPI statements.

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**Design Tools & Systems**

Is your organization using curriculum design tools that are, or will be, xAPI-compliant? Tool developers commonly used in e-learning (such as Articulate, Trivantis, Adobe) are planning or have started compliance with the new standard, and as adoption of the xAPI standard increases, many informal, social, and mobile applications employees already use will become compliant or have connectors to exchange information.

Committing to xAPI-compliance in design tools and systems is a simple first step for moving forward.

**Employee Adoption**

Do employees prefer accessing information through mobile devices, tablets, or other tools and systems they use daily? Since xAPI is a “behind-the-scenes” technology standard, receiving data from tools in the employee workflow (or other resources they are actively engaged with) requires minimal to no employee action. The xAPI is not another system of learning so this eliminates any employee adoption concerns typical of “single source of learning” systems. xAPI-compliant tools can transmit data about learning activities such as videos viewed in SharePoint or e-books read from a third-party vendor, without any additional employee action. With compliance from curriculum design and tool developers increasing, and employee adoption concerns minimized, the focus turns to leadership readiness.

**Leadership Readiness**

Part of evolving any part of an organization is gaining leadership buy-in. Establishing whether leadership is ready for change requires listening for key indicators. Do they think training can be more effective? Are they frustrated with employee performance? Are they looking for more tangible results? Are they asking for new ideas? Would they be interested to see how learning impacts business results? Key indicators open the door for discussions on changing current
Adam’s supervisor can get notifications from these xAPI-enabled systems that reveal insights to Adam’s performance. From the data in the LRS, he sees that Adam had been in two accidents and dropped one pallet all in his first week on the job. Going back to the reports from Adam’s first week, the supervisor concludes that Adam hasn’t been sounding the forklift’s horn at every intersection as he’s required. Adam’s boss could have a conversation with him or assign a forklift safety course to Adam before he is allowed to continue on the job. If the performance system didn’t send the notification, his boss wouldn’t have been able to intervene in such a way. That could lead to much more costly and dangerous accidents before someone helped Adam learn when to sound the horn.

Does Adam’s safety improve after the conversation? Does Adam’s safety skyrocket above that of others after the course? Should everybody take this course? There are many questions that arise when you have access to all of the data that xAPI lets you store and report on. Finding the answers allows you to make more informed decisions about how to help people do their best work.

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THE ENVIRONMENTAL MODEL USE CASE

[This sidebar was contributed by Neil Lasher. Used with permission.]

The environment model is a replica of your workplace, an opportunity to experience everyday scenarios in a safe environment with no fear of disruption or cost to the organization. This use case demonstrates how xAPI can be used to enhance these simulated learning environments.

Scene 1
You manage a chain of retail stores, a well-known brand with huge warehouses and manufacturing system in your supply chain. A salesperson, Joanne, who has won best salesperson each month for the last 11 months, throws a tantrum in your flagship store one morning, right in front of a customer. She snatches a bag from the customer, throws it on the floor and demands the customer leaves the store. You know you have to discipline her but you are not sure how. Using the environment model, you can discover all of the possible disciplinary methods available to you, the pros and cons of each and their likely outcomes. You decide to test the route of formal reprimand, in which the employee is given a letter and spoken to, a severe course of action that fits with Joanne’s behavior.

The result is that Joanne screws the letter up, says, “I quit,” turns on her heel and walks out of the store. This was not in the script or listed as a likely outcome. Your best salesperson just walked out the door, and the two remaining salespeople only started the week before. This simulation opens your eyes to what could happen if you are too tough on discipline. Your next step in the simulation is to push forward with training the rest of the staff. Unfortunately, your sales dip and you wonder how you will recover your numbers this week. The consequences of your decision just landed squarely at your feet—thankfully you are in a training environment and not the real world.

Where does xAPI come into the scenario? A designer can create statements for key places in the simulation and assign values for the different outcomes. So now there exists a measure of your progress through these simulations. You have been awarded a certain score based upon your decision-making in this scenario.

Scene 2
Back in the training environment you are faced with another discipline issue. John, a team leader and your only licensed forklift driver, drove his forklift deliberately into a pile of new stock, left it where it came to rest, and is now in the break room reading his newspaper. This was both dangerous and completely out of character. Once again you review the list of possible disciplinary options.

Eager to avoid the outcome with Joanne, this time you choose to have an informal talk with John. You find out that Joanne and John were engaged, but had just decided to call off the wedding. After your discussion, John apologizes and puts in overtime without pay to clear up the mess. Could a similar course of action resulted in a similar outcome with Joanne?

xAPI would be able to track your decision-making process in this scenario, and assign a value to your outcome, higher than the score you received after the first outcome in the store. The difference between the two would show a value gain as well as a learning outcome where a behavior change will probably have taken place. This is one example of how xAPI can be used to measure learning outcomes and behavioral change. Building reports of employee learning and performance data can reveal patterns; for example, you find that a majority makes similar decisions that do not suit the organization, so you create a scenario in which they can experience the results of their decisions and are guided to better decision making. Their success is clearly indicated by an overall value gain.

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tools and systems to comply with the xAPI standard.

See the job aid Assessing Organizational Readiness for the xAPI at the back of this issue for more information.

**BUSINESS IMPLEMENTATION OF xAPI**

Implementing the xAPI requires focus and cooperation from two key areas within an organization: L&D and IT. It is important to start small and build a business case for implementing the xAPI in your organization.

Once you assess L&D and organizational readiness, you should engage your business partners and explore their goals (for example, marketing wants to increase sales, operations to reduce costs and expenses, and HR to maintain compliance). Define a value proposition for the organization; incorporating ways L&D can contribute to the most important business functions (thus earning a seat at the table by contributing to business results).

Upon defining a value proposition and a goal for your organization, decide where learning is happening in the daily workflow, with or without your current support or involvement. Figure out what you want to know more about; is it how engaged learners are in discussions or other informal activities? Maybe you want to know how activities like using SalesForce.com, participating in forums, watching videos, or accessing a SharePoint document correlate to improved assessment scores or performance.

Plan to track a few key metrics that align with better decision making, to support your value proposition to the organization. An LRS or any other reporting tool will never provide you the answers, but they will help you ask better questions about how you can improve learning experiences to meet your goals. Ultimately, you are the expert—computing will only help you analyze and interpret data more efficiently.

**L&D Tactics**

- Embrace learning that is happening outside the classroom or an e-learning course.
- Identify and prioritize internal systems and platforms (Yammer, SharePoint) and external sources (SkillSoft, Lynda.com, YouTube) used by employees for informal learning, collaboration, and sharing.
- Select an LRS in partnership with IT.
- Choose one or two systems to start reporting the data you need to better understand employee effectiveness and performance.
- Iterate. Adjust what you’re measuring, add systems; because you will not have world-changing results on your first iteration. Rapid adjustments will need to be made to what, how, and who you are tracking and analyzing.

**IT Tactics**

- Establish whether existing systems, tools, and sources are xAPI-compatible or need a connector (such as API or a plug-in).
- Select an LRS in partnership with L&D.
- Ensure that the LRS meets the business security, scalability, and performance requirements.

**SELECTING A LEARNING RECORD STORE**

An LRS can stand alone or be a part of an LMS or reporting tool. It is installable (behind a firewall, hosted, or in the cloud). Here are some considerations when selecting an LRS:

- An installed LRS resides behind an organization’s firewall and provides the highest level of control and security if managed and maintained properly. This requires internal IT resources to set up hardware infrastructure (servers, memory, processors, hard drives, and so forth), install software upgrades, and provide continued support for newer versions of the xAPI.
- Hosting an LRS means that it is installed on computing infrastructure managed by an entity outside the organization, on predetermined or...
set resources. When more resources or upgrades are needed, the organization must work with the external entity to implement these. The LRS developer is not necessarily the same entity hosting it, but, it can be.

- A cloud LRS resides on managed computing infrastructure like Amazon Web Services, Microsoft Azure, or Heroku, so they are the most scalable and require the least IT resources from the organization. Cloud-LRS providers manage the LRS to constantly serve customers the right amount of resources needed to maintain a specific service level. However, IT may be less comfortable with storing internal data on cloud infrastructure.

Different organizations will have different LRS deployment needs and IT policies, so it is important to partner with the appropriate departments and leadership. In any case, you must ensure that an LRS is scalable, compliant, and secure. Here are some questions to ask to ensure an LRS meets your needs:

- **Scalability**: How much time does it take to store a certain number of statements or amount of data? Once the data is stored, how soon do you need it again for reporting or other activities? What are the storage limits (if any)? How long is the data stored and available? If your expected storage frequency or volumes increased, how would the LRS respond?

- **Compliance**: What versions of the xAPI does the LRS support? Does the LRS make any deviations from the xAPI standards that it supports? Does the LRS validate the data upon receiving it? When does this occur? What types of xAPI conformance tests have been performed on the LRS?

- **Security**: Is the data shared with any third parties? What authentication methods does the LRS support? OAuth? Basic Auth? Others? How is the data separated between different LRS customers if hosted or cloud-based? How is the data shared with other LRSs or reporting tools?

It is important to carefully select an LRS based on the needs of your organization, and to partner with the appropriate vendors, internal customers, and leadership. Ask the xAPI developer community, do some online research, and support forums for your prospective LRS vendors before making a decision. Remember, it is okay to have multiple LRSs in a single organization—the xAPI was built for data portability. Different LRSs and tools will provide you with different types of value.

**TECHNICAL IMPLEMENTATION OF xAPI**

This section describes how to select a tool or system for xAPI integration, and then take it through to sending initial statements. For example, you might know that employees regularly access information in Salesforce, so you decide to start with that system to better understand what they access and when. Here are some steps to get you started. The focus here is on high-level choices.

Choose a tool or system that is already used for learning. Remember, it doesn’t have to be “course-like.” It should meet at least one of these criteria:

- It is internally developed.
- It offers an API for accessing the learning-relevant data (not just for performing administrative tasks).
- It allows plug-ins to be created and installed.

Identify those learning events that can be easily tracked (given the constraints of the previous step, of course).

Map the elements of your event to the elements of a statement.
EMBRACING CHANGE

Change is always difficult, especially when a transformative and modern technology standard like the xAPI attempts to decouple "training" from "learning" and changes the way you operate in your role as a learning and development professional. What is important to remember is that the fundamentals of adult learning have never changed, and you should be able to enrich those learning experiences to meet the performance goals of your organization.

The xAPI affords us the ability to understand and improve learning experiences. The process will be difficult and maybe a bit slow. If you properly assess your organization’s readiness, discover use cases, partner with other business functions, commit to self-learning, start small, and understand how to conduct the strategic and tactical implementation, you will soon experience improved organizational performance.
**GLOSSARY OF TERMS**

**xAPI:** The Experience API, part of the Training & Learning Architecture, is an application programming interface developed by the Advanced Distributed Learning (ADL) group and realized by Rustici Software. It is also known as the Tin Can API. It can be used to store and retrieve extensible learning records, and learner and learner experience profiles, regardless of the platform used.

**ADL:** Advanced Distributed Learning group responsible for developing and maintaining the Experience API. This organization is part of the Department of Defense.

**DoD:** The United States Department of Defense.

**API:** An Application Programming Interface is a protocol intended for use as an interface by software components to communicate with each other.

**TLA:** The Training & Learning Architecture is an umbrella term that covers projects to design a rich environment for connecting training and learning.

**JSON:** JavaScript Object Notation is a text-based open standard designed for human-readable data exchange, comprised of simple data structures called Objects.

**Statement:** A structured piece of data consisting of “Actor,” “Verb,” “Object,” and other metadata to track an aspect of a learning experience. A set of statements can be used to track complete details about a learning experience.

**Actor:** The learner or team object to which the statement refers.

**Verb:** The action of the learner or team object.

**Object:** An activity, item, or agent that is the object of the statement.

**LRS:** A Learning Record Store is a data repository for learning records that are necessary for use with the Experience API.

**Analytics:** The discovery and communication of meaningful patterns in data. Especially valuable in areas rich with recorded information, analytics relies on the simultaneous application of statistics, computer programming, and operations research to quantify performance. Analytics often favors data visualization to communicate insight.

**Activity Stream:** A list of recent activities performed by an individual.

**Activity Streams:** An open-format specification for activity stream protocols, which are used to syndicate activities undertaken in social web applications and services.

**State API:** A sub-API defined in the Experience API, which is a scratch area for activity providers that do not have their own internal storage, or need to persist state across devices.

**Learner API:** A sub-API defined in the Experience API. The Agent Profile API is much like the State API, allowing for arbitrary key/document pairs to be saved that are related to an Agent.

**Activity Profile API:** The Activity Profile API is much like the State API, allowing for arbitrary key/document pairs to be saved, which are related to an Activity.

**Query API:** A sub-API defined in the Experience API to help filter recorded statements.

**OAuth:** An open standard for authentication that provides a method for clients to access server resources on behalf of a resource owner.

**Basic Auth:** Basic access authentication is a method for an HTTP user agent to provide a username and password when making a request.

**URI:** Uniform Resource Identifier is a string of characters used to identify a name or resource.

**URL:** Uniform Resource Locator is a specific character string that constitutes a reference to an Internet resource.

**UUID:** Universally Unique Identifier is an identifier standard used in software development.

**HTTP:** Hyper Text Transfer Protocol is an application protocol for distributed, collaborative, hypermedia information systems.

**HTTPS:** HTTP Secure is a communication protocol for secure communication over a computer network.

**REST:** Representational State Transfer. Software architecture for distributed systems; a web-service design model.
**GLOSSARY OF TERMS**

**Verb Repository**: An open source repository for Experience API Verb information, so Verbs can be reused and shared.

**SCORM**: The Shareable Content Object Reference Model is a collection of standards and specifications for web-based e-learning.

**CMI-5**: An e-learning interoperability specification being developed to replace the AICC and SCORM specifications. Now aligns the Experience API.

**AICC**: Aviation Industry Computer Based Training Committee.
REFERENCES & RESOURCES

Articles & Research


Webinars


Websites

Rustici Software. http://www.tincanapi.com

ASSESSING ORGANIZATIONAL READINESS FOR \textit{xAPI}

\textbf{Design Tools \& Systems}

Is your organization using curriculum design tools that are, or will be, \textit{xAPI}-compliant? Tool developers commonly used in e-learning (such as Articulate, Trivantis, Adobe) are planning or have started compliance with the new standard, and as adoption of the \textit{xAPI} standard increases, many informal, social, and mobile applications employees already use will become compliant or have connectors to exchange information.

\begin{itemize}
  \item 1. Is the organization using content design tools that are \textit{xAPI}-compliant? \hspace{1cm} Yes \hspace{0.5cm} No
  \item 2. Do employees currently use multiple systems to access information for learning? \hspace{1cm} Yes \hspace{0.5cm} No
  \item 3. Is it important to have learning data from third-party vendors and tools? \hspace{1cm} Yes \hspace{0.5cm} No
  \item 4. Is data from simulations or mobile learning difficult to aggregate? \hspace{1cm} Yes \hspace{0.5cm} No
  \item 5. Is learning data analysis important to the organization? \hspace{1cm} Yes \hspace{0.5cm} No
\end{itemize}

\textbf{Employee Engagement}

Do employees prefer accessing information through mobile devices, tablets, or other tools and systems they use daily? Since \textit{xAPI} is a “behind-the-scenes” technology standard, receiving data from tools in the employee workflow (or other resources they are actively engaged with) requires minimal to no employee action. The \textit{xAPI} is not another system of learning so this eliminates any employee adoption concerns typical of “single source of learning” systems.

\begin{itemize}
  \item 1. Would employees prefer to learn using tools and systems they are familiar with? \hspace{1cm} Yes \hspace{0.5cm} No
  \item 2. Would they like to include third-party training programs in their learning profiles? \hspace{1cm} Yes \hspace{0.5cm} No
  \item 3. Are they engaging in informal learning on the organization’s online social networking platform(s)? \hspace{1cm} Yes \hspace{0.5cm} No
  \item 4. Is it difficult to get employees to train within your current learning structure? \hspace{1cm} Yes \hspace{0.5cm} No
  \item 5. Are user-generated videos and documents a popular method for learning in your organization? \hspace{1cm} Yes \hspace{0.5cm} No
\end{itemize}
**ASSESSING ORGANIZATIONAL READINESS FOR xAPI**

**Leadership Readiness**

Part of evolving any part of an organization is gaining leadership buy-in. Establishing whether leadership is ready for change requires listening for key indicators, such as the ones listed here. Key indicators open the door for discussions on changing current tools and systems to comply with the xAPI standard.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>1. Is leadership asking for more than just reporting on completion rates and scores?</td>
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<tr>
<td>2. Would analyses of both formal and informal learning activities be valuable?</td>
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<td>3. Is it important to tie learning to tangible business outcomes?</td>
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<td>4. Are learning data analyses and machine learning in your roadmap?</td>
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<td>5. Is the organization being asked to do more with fewer resources?</td>
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