Introduction

Integrating, analyzing and visualizing data from multiple systems is needed as there's more to learning than what gets captured in a single LMS. Optimistically, the open standards-based xAPI LRS from Yet Analytics could provide a foundation to help address this challenge.

Evaluation Framework

Multiple sources (Bates, 2014; Scheffel, Drachsler, Stoyanov, & Specht, 2014; Cooper, 2012; Osterweil, Shah, Allen, Groff, Kodidala, & Schoenfeld, 2015) have inspired this evaluation framework.

Dimension	Sub-dimensions	Analysis
Stakeholder Perspectives (Goals, Benefits, Challenges, Culture)	Students Teachers Institution IT / Data	• **Students**: Focused dashboards consolidate learning activity data. Students can also compare themselves to the average student. • Progress and achievements are analyzed in real-time. • **Teachers**: Navigate between individual learner or group views. Views show "activity patterns": ○ "Time of activity, duration, and habit, common and uncommon content usage, correlations between scores and activity pathways, digitally introverted or extroverted, decision making, common needs & problem areas" (Roth, 2017) • **Institution**: Vendor highlights the ease with which data can be integrated and visualized. • **IT / Data**: Creating an initial LA ecosystem that leverages the LRS could take two to four years, and many skilled technologists (Blake-Plock & Hoyt, 2018).

Ease of Use	Performance / Scalability
	Platforms
	User friendliness
	Accessibility
		• **Performance/Scalability**. Using "Kappa-Architecture" to scale, a crucial requirement, is intriguing (Blake-Plock & Hoyt, 2018, pg. 2).
		• **Platforms**. Deployable via Cloud, On-Prem or virtual private cloud. End users access product via computers or mobile devices.
		• **User friendliness**. Demo videos show a modern, visually-appealing user-interface.
		  ○ xAPI, the experience API, is indeed focused on experiences. Dashboards and visualizations look "pretty" but, provide a thin veneer onto the experience (actor-verb-object) data.
		  ▪ Can the provided visualizations provide a more thoughtful summary of the data?
		• **Accessibility.** Accessibility not mentioned in collateral.

Dimension	Sub-dimensions	Analysis
Costs	Acquisition Ongoing Funding (subscriptions, licensing, etc.)	• Pricing. Ranges from $3.99/profile/year down to $1.01/profile/year. • **Ongoing Funding**. Support, integrations, reports, queries, visualizations, aligning with learning goals and interventions, etc.

Ecosystem	Training
	Support
	User-base
	Partners
	Resources
		• Still early days for xAPI and for Yet Analytics, for instance, it has been just over a year since they unveiled the "first-to-market data dashboard for blended learning." According to Crunchbase, Yet Analytics:
		  ◦ started in 2014
		  ◦ 11-50 employees
		  ◦ $2M in funding
		  ◦ 11k monthly website visitors
		  ◦ $2.5M in annual revenue (licenses vs. services?)
		• Formal training options not visible.
		• Few case studies published.
		• Partnerships: Trivantis, eThink Education, IBM, HP, and Learning Commons.
		• A small collection of resources (eBooks, articles, presentations, and youTube).
		• Professional Services: Data assessment, competency framework, taxonomy & analytics profile, xAPI integration, and advanced analytics.

Networking and Integrations	Integrations
	Extensibility
		• xAPI is an open standard for developing integrations and aggregating learning data.
		• ADL certified xAPI Conformant LRS highlights standards adherence.
		• Data can be transported from LRS to other tools for further analysis, visualization, etc. Data can flow back to original source systems to support feedback loops (Roth, 2017).
		• xAPI is very flexible, but need to be cautious of inconsistencies, unnecessary implementation variability, and difficultly when combining datasets from various sources (Berg, Scheffel, Drachsler, Ternier, & Specht, April 2016, pg. 545).
		• xAPI Data Statement can integrate:
		  ◦ Live and Persistent Data:
		  ▪ Native xAPI LMS options
		  ▪ Custom built Integrations: Slack, GitHub, etc.
		  ◦ Historic and External Data – DB, JSON, CSV (Roth, 2017).

Dimension	Sub-dimensions	Analysis

Education	Pedagogy
	Interventions
	Impact on Learning
		• **Pedagogy**. xAPI specification is highly influenced by Activity Theory and Constructivist learning (Kevan & Ryan, 2016, pg. 144). Additional principles: feedback loops, network analysis, and transparency.
		  ○ Stakeholder driven interpretation of data and definition of interventions.
		  ○ Captures "high-resolution" learning activity data (Roth, 2017).

Data	Security and Privacy
	Quality and Sources
	Analysis
	Reporting
	Visualizations
		• **Security and Privacy.** Content is generally at marketing level and lacks details. Claims of security, automated integrations management, machine learning and other dimensions sound impressive, but details needed.
		  ○ Adherence to GDPR
		  ○ They do have a posted Terms of Service and Privacy Policy, however, this appears focused on their public website and not the actual product (which would be key in SaaS).
		  ○ Help Desk does not discuss security.
		• **Data Quality & Sources**. "Garbage in / Garbage out" is the key mantra.
		• **Visualizations** are supported, varied and visually appealing. Need to confirm value and impact as details are lacking.
		• Integrations with other products are key to rich **reporting** and **analysis**.

Commentary

At a minimum, risk arises as this is a young company with a new product in an area that would require significant investment over a long timeframe. Further complications arise from Yet Analytics providing little detailed support for their claims. Demo videos and documentation show a thin veneer above the experience data leading to expectations that further work (and tools) are needed as success hinges on developing relationships between experiences and learning goals (Kevan & Ryan, 2016, pg. 147). Proceeding at a cautious pace and starting small with hands-on experimentation focused on building integrations, views, and queries would provide valuable learning. Another important area to consider is determining what information will be aggregated, how it will be analyzed and potential areas of impact. Further, while a SaaS offering has appeal from a core competency and convenience point of view, the lack of security and privacy information makes a cloud offering a risky proposition. Also, user testing is needed to validate workflows and ease of use.

While there are gaps in Yet's supporting information, a thoughtful investigation and investment in xAPI and LRS is supported by results such as those observed by Durlach, Washburn, Regan, & Oviedo (2015) and also Murphy, Hannigan, Hruska, Medford, & Diaz (2016), whereby xAPI was able to capture live data to support personalized training, inform teachers, feed data analytics and align with assessments. To address concerns about investing in a new, small vendor for a critical part of an LA solution, another step would be to concurrently investigate use of a full open-source stack rather than a proprietary solution. The overall ecosystem is broader than it appears if we consider xAPI in general[1] rather than just Yet.

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[1] https://www.adlnet.gov, https://xapi.com, https://xapi.com/adopters/

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