July 13, 2009

The eLearning Guild's

LEARNING SOLUTIONS SM

Practical Applications of Technology for Learning e-Magazine

THIS WEEK: Management Strategies

LETSI and the Past and Future of Interoperability Standards

By Aaron Silvers

The world of e-Learning standards can be confusing and daunting, not to say controversial. I'm going to try to sort out the major players in this field, and to talk about their roles in shaping the tools, technologies, and pedagogies that we and our children will be using over the next twenty years.

Obligatory disclosure statement: I'm a chairing member of the International Federation for Learning, Education, and Training Systems Interoperability (LETSI). It's a non-profit organization dedicated to improving systems interoperability and supporting innovation in learning, education, and training technology. I don't pay membership dues, and they don't pay me. I participate because I like LETSI; I really like the people who make up the community. As an organization, LETSI is in a very interesting space with an uncertain future.

As in any situated learning, to understand LETSI one must also understand the context of what and where LETSI is as an organization. Toward that end, I offer a condensed history of learning technology standards.

The wonderful world of standards

Most people hear "standards" and yawn. Heck, standards make me pass out cold, and they're largely how I've built my career.

Standards organizations make it possible for different systems to work together because standards hold the measures by which we apply and use technology across very different fields. So, for example, IEEE (a non-profit professional association for the advancement of technology) standardizes everything from power outlets to FireWire to the metadata in e-Learning content;

Interoperability standards, of which SCORM is the best known today, have a long history. Today these standards are at a crossroads, involving multiple organizations, educational institutions, and governments around the world, and with requirements to support both traditional and emerging modalities. This week's author offers an overview of the emergence of LETSI, the newest of the three organizations involved in SCORM!

A publication of

THE ELEARNING GUILD

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Book Review

Programming for e-Learning Developers, *by Jeffrey M. Rhodes*

ISO (International Organization for Standardization, an international standard-setting body) standardizes learning services, as well as light bulbs, gears, and even the cigarette.

These standards are cobbled together by individuals, out of larger common goals through an intense process of negotiation about every detail. So only through big and little points of negotiation do some of these models actually become standards. It takes a lot of commitment for a set of instructions to become an ISO or an IEEE standard. The instructions must incorporate into an ecosystem as reliable and widely adopted as the light bulb. No matter where you are in the world, you can count on getting a light bulb at a local store that will fit in a light socket from a completely different manufacturer.

With ISO and IEEE responsible for such diversity of standards, you might wonder who puts those standards together. After all, there are far more light bulbs in the world than there are e-Learning courses, which belies the fact that IEEE has standards related to e-Learning.

These large standards bodies assemble many standards, often from specifications developed by smaller, more focused consortia. Much of e-Learning, as we know it today, was spawned by two such consortia: AICC and IMS Global. Most pertinent to this article, the Sharable Content Object Reference Model (SCORM) is a convergence of the efforts of those two major consortia, and of the IEEE.

A compressed history of SCORM

AICC (Aviation Industry CBT Committee) serves the people who operate, maintain, and build airplanes. The AICC's constituents required, for a host of reasons, training that was easy to distribute and reliable in its ability to report on the progress of on-the-job training.

IMS takes a little more explaining. In 1997 there was a trade organization for higher education specifically for promoting the use of information technology; this group was called the National Learning Infrastructure of EDUCAUSE. As its members spanned a variety of different organizations, each facing a common set of problems, a specialized consortium grew out of EDUCAUSE to specify how its members could share the expense of research and development in a common way. That consortium is the IMS Global Learning Consortium (IMS/GLC or simply IMS). IMS is "a global, non-profit member organization that strives to enable the growth and impact of learning technologies in the education and corporate learning sector worldwide" (you can learn more at http://www. imsglobal.org/background.html). IMS has a diverse membership including corporations, K-12 education, and government organizations, and much investment in IMS comes from higher education organizations.

As far back as 1992, AICC had what we now call a Learning Management System (LMS) – then called

ADL's framework that combined AICC's CMI data model and API with the IMS Metadata and Content Packaging specifications is SCORM. As a document library all on its own, there have been several major revisions to SCORM since its origins in 2001, generally keeping SCORM aligned with the revisions to its specifications and standards.

The eLearning Guild's LEARNING SOLUTIONS e-Magazine
Practical Applications of Technology for Learning

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Learning Solutions e-Magazine™ is published weekly for members of ***The eLearning Guild***, 375 E Street, Suite 200, Santa Rosa, CA 95404. Phone: +1.707.566.8990. www.eLearningGuild.com

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Computer Managed Instruction (CMI) – and, with it, its data model. This provided the ability to track information about the learner's experience with learning content. AICC's specifications even provided the means to sequence discrete pieces of learning content and the pre-requisites needed for a learner to experience that content, all those years ago (see AICC CMI draft specification, May 1992, http://www.aicc.org/docs/tech/cmi001v1d1.pdf).

For its members, IMS specified a number of things. Metadata and Content Packaging solved specific problems for their members. How each member of IMS might apply those specifications for their own organizations was still pretty subjective. A university that produced Computer Based Training (CBT) and used the Metadata spec, might not use Content Packaging if they were running CBT off of CD-ROMs. A larger, private university might have built their own custom learning portal, employing both Metadata and Content Packaging. IMS produced other specifications, for use as needed. The advantage to this system is that the members traded sweat equity for the specs they really needed. The types of needs for each member might be different from the needs of other members, but where they were similar, each member could participate and share the result of their collective effort. That tends to happen with grassroots organizations, and that diversity is healthy.

That diversity, however, comes at considerable expense – one that could be mitigated if all the beneficiaries of such efforts could be aligned. In the late 1990s, that was almost impossible to think about in the field of higher education. However, the U.S. government saw a potential to save hundreds of millions of dollars in training the military and its workforce – and the government had the ability to align their various organizations. So, in 1998, then-President Bill Clinton issued an Executive Order that created the Advanced Distributed Learning (ADL) Initiative, with the purpose of oversight, research, and development of online learning. The Executive Order has mandated use of ADL for the last several years by all military and federal agencies. ADL is situated in the U.S. Department of Defense, but there has been a strong civilian presence in the organization throughout its history, serving in various leadership roles. One of those leaders, ADL's original Chief Architect, was a man named Phillip Dodds.

Dodds was very interested in the body of work that was coming out of IMS, and connected a need the U.S. government had for accelerating training through distributed learning and its need to cut the cost of training. He also recognized how the specifications that IMS produced, namely Metadata and Content Packaging, could help fill those needs – if the way in which they would be applied could be mandated across all the different parts of the U.S. government. ADL made a handshake agreement with IMS to allow ADL's use of their specifications. A similar accord was made with AICC.

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The most widely adopted version of SCORM is Version 1.2, which also leveraged the IMS Content Packaging, though at the time of this writing the 4th Edition of SCORM 2004 is current, and it leverages the IMS Simple Sequencing specification.

Shifts in orbit

Over the years, the relationship between ADL and IMS became strained from the accord that brought the IMS specifications into SCORM. Much is left to one's interpretation of what exactly happened, but I will attempt to offer some perspective, noting that from 2003-2006 I worked on the technical team for SCORM 2004 as the content developer for ADL.

A considerable investment of effort and money goes into producing a specification. ADL agreed to join IMS, and to make its resources and people available to IMS working groups to participate in the evolution of IMS specifications. This was a clear success for IMS: the largest possible adopter of specifications was adopting and committing to help evolve their works. With no less a partner than the U.S. Department of Defense, IMS members could count on their works to evolve and expand.

Such heavy investment carries costs in ways that aren't financial. Once SCORM Version 1.2 was heavily adopted, both inside the government and in the public sector, the specifications now impacted far more organizations than the members of IMS, as a consortium. Until ADL became involved, the users of the specifications IMS produced were also, in large part, the members themselves. Now the number of users who had adopted the specifications was in the millions. SCORM users were around the globe, and in all manner of organizations beyond the higher education institutions that (at the time) principally made up IMS' membership. As it was the most widely adopted implementation of IMS specifications, gravity around SCORM and its steward ADL tilted the relationship with IMS. Before SCORM Version 1.2, organizations, including ADL, orbited around IMS. Now, IMS was in the tenuous position of adjusting to the new orbit around ADL, both as an adopter of their specifications, and as the steward of SCORM as a framework adopted by millions.

This gravitational shift was complicated by the inclusion of another specification by IMS into SCORM: Simple Sequencing. The idea behind Simple Sequencing was that the navigational rules of learning objects (granular units of learning content) could be external to the learning content itself. This was desirable for two reasons: removing navigational rules from a unit of content would make that content piece infinitely more reusable, and, if content was discoverable with the use of Metadata, it would enable the automation of tailored learning – possibly enabling intelligent tutoring systems.

In 2003, when coupled with the implementation of the other specifications in SCORM 2004, IMS Simple Sequencing was incompatible as specified. ADL needed to modify the specification heavily to implement Simple Sequencing. ADL and IMS eventually came to an agreement by which ADL would provide a resource, as a member of IMS, to revise the Simple Sequencing specification so that it could be implemented into SCORM 2004.

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Hindsight making all things clear, this was a tipping point in the relationship between ADL and IMS. In 2006, IMS wanted to resume their activity on Simple Sequencing, as it was interdependent with another IMS specification called Common Cartridge. The problem was that the work that ADL put into Simple Sequencing, for SCORM, was never fully harmonized with IMS' Simple Sequencing specification. Assuming the best of intentions on both sides, this was a huge miss. The debate over which version of Simple Sequencing was actually "correct" became a schism that affected a series of decisions about the future of SCORM.

The controversy over SCORM: the beginning of LETSI

Even in 2004, the understanding inside of ADL was that there would come a day in the (then) not-so-distant future when the U.S. Department of Defense would no longer shepherd SCORM. It would be turned over for another steward to continue to evolve and grow it. ADL was then, and still is today, interested in a number of pursuits beyond just SCORM.

By 2007, the acrimony between ADL and IMS had become fierce. Even the announcement of a partnership between ADL and IMS was delayed almost 90 minutes with last minute arguing by the principals involved. I was at the meeting. It was like attending a wedding where the bride and groom are already seeking counsel to handle the divorce, even while they're committed to going ahead with the ceremony. At the time, I had been away from ADL in any official capacity for a year. It seemed to me to be a tense meeting.

Before this, it was pretty commonly held, even within ADL, that the eventual steward of SCORM would, rightly, be IMS. Except for CMI (from AICC), every other part of SCORM was at one time an IMS specification. As the relationship spiraled downward, there was no clear steward organization. The relationship was so tense that I doubt anyone inside of ADL trusted that IMS would shepherd SCORM to satisfy the needs of the U.S. government.

ADL, as an initiative under the U.S. Department of Defense, has a mission that concerns itself primarily with adoption inside the U.S. government. This put the stewardship of SCORM, within ADL, at odds with the global community. All manner of educational institutions, commercial enterprises, and foreign governments and militaries all around the world depend on SCORM as their technical framework for online learning. The notion of the U.S. government "owning" SCORM was becoming more and more controversial as global adopters wondered what was next.

In late 2007, global adoption of SCORM (across all versions) meant that, as a community of SCORM adopters, the U.S. government was but one large member. This view (the U.S. as a member of a community of SCORM adopters) spurred the decision to support a new, non-governmental organization dedicated to shepherding SCORM: this became LETSI (Learning-Education-Training Systems Interoperability).

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This decision to hand SCORM over to LETSI was controversial. While there are pending legal challenges as of this writing, ADL decided in May 2009 that it must maintain stewardship of SCORM. This presents an interesting opportunity for LETSI.

What does a community of enthusiastic learning technologists do when the reason for getting together no longer exists? In LETSI, a grander purpose was always with the group.

LETSI's reason for being

Phillip Dodds passed away in late 2007. A few weeks after his death, many long time members and leaders in the evolution of SCORM gathered together in Washington, D.C. to talk about what should happen next with SCORM. I blogged about it at the time (http://www.aaronsilvers.com/2007/10/the-way-forward/), not because of what was decided, but because there was a chemistry among the participants – a renewed sense of purpose.

Many of the people who helped shepherd SCORM through its iterations also had a host of things they would like to be doing instead of staying within the scope of the purpose SCORM served. The obvious break from the past – the unfortunate passing of its architect and a turn in the relationship with IMS – presented an opportunity. The last year has been a very exciting time for many who are passionate about emerging technologies for learning.

It's in that spirit that LETSI has a cause beyond being a steward of a ten-year-old framework. It's tough to identify an existing group that crosses so many geographical regions and market boundaries (K-12, higher education, corporate job training) and that includes educators, technologists, vendors, and policy makers – as individuals – AND the associations that represent these stakeholders. LETSI believes that inclusive of today's education and training realities, its open participation model supports diversity – and that diversity leads to innovation through collaboration.

Knowing that anyone can participate in the community, and that LETSI openly welcomes individuals and organizations from every field and from every part of the world, LETSI is becoming a community of practice for learning technologists. Members have their eyes fixed on a more open and interoperable future, while their feet are firmly planted in the market and organizational realities of today.

Roughly 70 members of this community gathered in Florida in October 2008 to answer LETSI's initial question: *What does organizational learning need to look like for the next ten years?* Their answers culminated in an Assumptions Document about (then-labeled) "SCORM 2.0." The full document is available to all online at https://letsi.org/images/letsi_media/SCORM_2%200_Assumptions_2009Feb09.pdf. At a high level, this effort concluded that:

1. ADL will continue to develop SCORM 2004, providing a stable basis for the SCORM community.
2. There is a need to support interoperability across systems that represent pedagogical, technological, and business models that are different from those supported today (including SCORM).
3. LETSI will use agile software techniques and community-sourced software projects to facilitate more rapid and consistent adoption of software standards, while lowering barriers to innovation. (https://letsi.org/index.php?option=com_content&view=article&id=82&Itemid=95)

How LETSI is different

I offer my perspective on how LETSI is different from IMS and from ADL. I hope you'll find there is a clear role for LETSI, and a critical need for LETSI to work closely with IMS and ADL going forward.

LETSI is aspirational

IMS' greatest strength has always been that it is a tight community of practice, focused on solving a certain set of problems in information technology. They've grown quite a bit since the 1990s, and as a result, they've matured as a specification body. IMS really knows how to crank out good specifications. They were very successful with Metadata. ISO is about to adopt Content Packaging (sometime soon ... I think ...). This makes putting a content package in a learning management system on par with plugging a 60w light bulb into a socket. It just works.

ADL's greatest strength was always that it could apply the specifications through research and development into solid technical examples and tools. SCORM is more than the reference books. ADL produced a conformance test suite and a sample run-time environment to demonstrate the implementation. This accelerated the ability for entrepreneurs, vendors, and developers to adopt the tools – they had working models they could measure their work against.

LETSI draws membership from a broad pool of passionate learning technologists, interested in solving interoperability issues across many domains – not just learning systems. The clearest distinction is the approach to the learning technology challenge of interoperability: IMS Common Cartridge solves a problem of how to transfer content across LMSs. LETSI's architectural plans solve the problems of transferring all data (not just content) across all systems (not just LMSs).

For LETSI to be successful as a vehicle for … change, it needs to establish, maintain, and nurture meaningful liaison relationships with standards organizations and initiatives, producing and adopting standards of interest.

LETSI's architectural plans are progressing on several fronts, the most obvious being the SCORM API Web Services. There are currently three different teams modeling different Web service implementations of the SCORM runtime. The Web services act as a tunnel to expose content anywhere to a SCORM runtime – but one could expand the very same architecture to make use of many other APIs.

LETSI is a community

ADL is a recognized program under the Office of the Secretary of Defense, within the U.S. Department of Defense. There is a definite hierarchy assumed within ADL as a traditional organization. Even if you don't know who's who in the organization, it's easy for most people to imagine how ADL is structured.

IMS is a consortium. There's a cost to membership, and its works are made public with registration on their site, a perfectly acceptable means for the organization to understand who uses their work, and how it is used. IMS has a board and elected officers. IMS has a few full-time employees to help facilitate all the specifications advancing through their working groups. It's a strenuous effort to mediate arguments, to keep people (largely volunteers from competing organizations) focused on common goals, and to align documents to existing reference materials.

LETSI organizes with a different approach. There's no board. The obvious leaders within LETSI lead by doing. That ability for members, not sponsors, to direct is somewhat unique.

Since sponsors don't control LETSI's technical direction, LETSI is also different from IMS and ADL because of its chances for viability. LETSI lacks the need for a lot of overhead, but it takes funding to keep the community going. Why would sponsors invest in the organization if they can't directly influence it?

Once again, the diversity of LETSI's membership, and its open exchange of ideas, is inspiring another innovation: a "Pitchfest." The idea, born in a recent technical working group, was that LETSI will hold conferences attended by the broader LETSI community and potential sponsor organizations. The innovative ideas in the community would be presented; participants and sponsors would then align their activities to the idea under the guidelines that the work and process remain open. This allows a broader range of sponsors and members to work on innovations they are passionate about. Should the governance and the funding model of such an event emerge so that it is accessible to any interested parties, the chances of its success will improve dramatically – as well as its potential to grow into a model for funding other open-source initiatives.

LETSI is young

ADL and IMS, while very different types of organizations, are over ten years old. LETSI is barely over a year old. Its lack of maturity, its difficulty in being represented (or even understood) appropriately (even by its own members), and its changes in direction over the last year are serious challenges. LETSI must overcome these in the next year to be effective, let alone viable, going forward.

I understand why it's difficult to partner with an organization one doesn't understand, and therefore doesn't trust.

LETSI is still finding its stride. While the change from stewarding SCORM to looking over its horizon is, in my opinion, a very healthy change – it's one that's not been managed well. LETSI is a community that really does aim for openness and transparency, but its efforts (Web Services, for example) would benefit by consistent reporting and a way for the public to see how the effort is progressing in real-time. The same must be said for LETSI's architectural plans: there must exist a definitive statement that describes what LETSI's Architecture will look like.

Even if it's the wrong plan, LETSI will, at the very least, illustrate through its reasoning why the status quo of learning technology must change to accommodate emerging and unrecognized styles of learning. Being more agile is one benefit of youth. LETSI must be willing to visibly fail forward and innovate by example. The community has the talent to do it.

LETSI's ranks include people who work(ed) with ADL, and some who are or were members of IMS. Its members also include a lot of people who are not software engineers, chief learning officers, or vendors. Much of LETSI's membership includes people who implement e-Learning in some form, such as:

- People with various titles who use Articulate Presenter or Adobe Captivate to build learning content and are crafting it a step beyond what's out of the box;
- People who craft blended learning solutions using WebEx and Sharepoint because their LMS doesn't do everything they'd like it to do; and
- People who are designing role-plays and simulations using their organization's voice mail and e-mail systems to augment the reality of the workday with learning opportunities.

LETSI is a community for learning professionals who like to tinker, looking beyond what tools and media are available to what such things might be able to do.

These types of learning professionals tend to define the "better" (never "best") practices in all forms of e-Learning. They're the ones who reduce the time and

cost of implementing technology so that the real investments can be made in competitive innovation instead of re-inventing the wheel.

Without disruptive change, there is little hope to realize the impact of technological innovation on education; this is particularly true for K-12 education. LETSI is poised to be an effective community of service in a space that heavily impacts how organizational learning, education, and training happen around the world – but LETSI must be viable in order to be reliable. For LETSI to be successful as a vehicle for such change, it needs to establish, maintain, and nurture meaningful liaison relationships with standards organizations and initiatives, producing and adopting standards of interest.

Will it be successful? If you'll pardon the pun, "Let's see ..."

Author Contact

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Aaron holds a Master's in Curriculum & Instruction from the University of Wisconsin. Married to his wife, Suzy, since 1996, Aaron is a proud father to two precocious girls and a boxer named Mr. Chompers. Aaron's Web presence includes aaronsilvers.com, letsi.org, and Twitter (@mrch0mp3rs).

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