Reuse and Sequencing: Do we still want them?

Mike Rustici, July 31, 2008

The direction that ADL has taken with SCORM is predicated on some basic assumptions that were made long ago. It behooves us to reexamine these assumptions now that we have arrived at the crossroads of SCORM 2.0. This paper doesn't have any answers, but hopefully it will stimulate some discussion on what we are really trying to accomplish.

As I see it, there are two core tenets of SCORM that were essentially predictions of a future that has yet to come true.

1. We are heading towards a world where content is often reused at the SCO level and repositories of SCOs will be available for courseware developers to pull from.
2. We are heading towards a world where intelligent systems will provide adaptive and individually tailored instruction by assembling SCOs into instruction on the fly.

This is a fantastic vision of how the technology can add real value to instruction and learning. The questions in front of us today are:

- "Are we still striving towards these visions?"
- "Are people actively seeking these goals that could benefit from standardization?"
- "Is this technology attainable in the near enough future to warrant consideration in current specifications?"

I believe the answer is "yes" (or at least "probably") to all of the above questions. The implications of continuing these assumptions, however, are sufficiently profound that it merits LETSI making a conscious and stated decision to continue along this path. I predict we will see two "camps" emerge during the upcoming white paper submission. One camp will be the traditionalists who want to stay the course and pursue this vision of the future. The other camp, I'll call the pragmatists, has already started to emerge in the blogosphere. These folks are looking for a simple solution to interoperability. They have a very "Web 2.0" mentality...focus on doing one thing well, keep things simple and include only the bare minimum set of features. LETSI will need to decide what it's vision is and which camp to please. Perhaps it is possible to please both sides, but I believe the traditionalist path invariably leads to complexity that the pragmatists abhor.

Why does the traditional path lead to complexity? Because it leads us to create small reusable SCOs. Small and reusable is harder than big and isolated. Reusable SCOs need to be discovered which leads us to repositories and registries. Finally, to form a cohesive course from small parts, we need sequencing and navigation...which is a tough nut to crack. That leads me to the second big question for this paper (inextricably linked to the earlier questions):

- "Do we still want or need sequencing?"

I see the following motivations for sequencing:

- Sequencing enables reuse of discrete content pulled from a repository and assembled into a larger instructional unit.
- Sequencing enables you to author more granular content thus potentially enabling reuse.
- If you can create more granular content, you enable an intelligent LMS to adaptively tailor individual instruction.
- Sequencing *could* enable content developers to more easily create content by creating a simpler navigation scheme

Thus, sequencing is only valuable either if reuse is valuable OR if it is simple enough to be easier than creating your own alternative. This conclusion begs the questions:

- "Is reuse at the SCO level desirable and useful?"
- "Can we create a simple and useful sequencing specification?"

My Thoughts on My Own Questions

I told you this paper doesn't have any answers, but here are a few of my thoughts and opinions on each of the questions I've posed above.

"Are we still striving towards these visions?"

I have no idea....like I said, no answers, just questions to stimulate discussion. However, I do feel strongly that as an organization, LETSI needs to decide what it is striving for and why we are here.

"Are people actively seeking these goals that could benefit from standardization?"

I believe so. The question is are there enough of them to warrant major expenditures of time, effort and money in the standardization community?

"Is this technology attainable in the near enough future to warrant consideration in current specifications?"

I believe this technology is feasible and attainable very soon if not now. My co-chair on the program committee, Robby Robson, and his company Eduworks, have developed some technology that takes great leaps forward in this arena. The challenges ahead of us are more business-related than technological.

"Do we still want or need sequencing?"

Something has to happen to make sequencing valuable, either:

- Sequencing needs to be simplified so that it is easier than creating your own alternative.
- Adaptive learning needs to become a reality with an LMS taking inputs from external systems that content does not have knowledge of or access to. Only in the case where the LMS knows more than the content does it make sense for the LMS to control sequencing and navigation.
- Repositorites of reusable content need to become available and practical from both a technical and business perspective.

The current sequencing specification is too complicated for most content developers to use. Unless we get to the point where inputs (like learner competencies) are coming from an external system which can enable more effective learning, it is easier, cheaper, more efficient, better looking and more powerful if content developers just write their own sequencing logic. Sequencing isn't relevant unless we get to the point where externally defined competencies are used as an input to the sequencing process.

Sequencing could also be made relevant if it is easier to implement than what a web developer could do in simple scripting language. Currently it is not. Either we have to drastically simplify sequencing, or we have to justify it with huge gains from elsewhere.

"Is reuse at the SCO level desirable and useful?"

Reuse is a valid goal, but not for everybody or at the level of granularity many expect. Effective reuse can be accomplished more easily, I believe with "30 minute SCOs" than it can with "1 minute SCOs", and the sequencing between such SCOs is far simpler than what is required between shorter SCOs. A specification that enables reuse for advanced users should not hinder the masses for whom simple deployment and interoperability would be a godsend.

In our shared vision, there are two forms of reuse that need to take place, reuse by a human aggregator and reuse by a machine aggregator. Enabling reuse by a human requires far less technical consideration than enabling reuse by a computer. The current specifications are sorely lacking in the technical metadata that would facilitate computerized aggregation of reusable assets. Even if we only strive for human re-aggregation, there still needs to be more technical metadata describing how a SCO operates for it to be effective.

"Can we create a simple and useful sequencing specification?"

Yes, I believe we can. I have some thoughts on the basis of such a specification that I intend to submit in a separate white paper.