Have We Reached Interoperability Nirvana?

Understanding how e-learning architecture can help end users achieve their goals

BY ROBBY ROBSON

E-learning has set itself some rather lofty goals. Among them: improving performance; making training more efficient; aligning learning more closely with business goals; enabling anytime, anywhere learning; and ultimately, making education more effective and businesses more profitable. But progress toward these larger goals will be difficult until we take care of some basics. The challenges that are first and foremost on the minds of people in the e-learning trenches are simple and direct:

- Content bought from one vendor should install and run without difficulty on an e-learning platform purchased from another vendor.
- IT departments should be able to integrate e-learning software into the enterprise without much fuss and without undo expense.
- Instructors should be able to easily plug their favorite learning tools (e.g., a quiz tool, chat room, or simulation) into a learning environment.

Challenges like these are driving e-learning standards development and have led to increasing interest in e-learning architectures.

Interoperate this!

E-learning standards have from their inception been focused on interoperability, which the free online dictionary of computing defines as “the ability of software and hardware on multiple machines from multiple vendors to communicate.” In e-learning, interoperability refers to communication among the components of an e-learning environment. To enable such communication, we must define what the components are and how they communicate. This is what an architecture does.

To understand the need for an architecture, it helps to appreciate the complexity of enterprise computing. A seemingly simple activity like delivering Web content to a browser can involve a multitude of steps and products. It can involve software that verifies the user’s identity, authorizes the user to view the content, finds and retrieves the content, routes the content, as well as displays the content. If the user needs to buy the content, systems that manage e-commerce or interdepartmental accounting also play a role. We haven’t even talked about network infrastructure, database management, load balancing, and a host of other behind-the-scenes activities. Any of this could go wrong at any time, and the next release of a small component might introduce totally unintended consequences that bring down the entire system. As any IT manager will attest, the road to IT hell is paved with upgrades.

Breaking up is good to do

Architectures prevalent in enterprise computing break complex systems into well-understood components with well-defined interfaces that allow them to be interconnected. A simple analogy is a desktop computing system, with parts (computer, monitor, printer, etc.) that can easily be hooked together via cables or a network because someone has defined exactly how the parts communicate with each other.

As is the case with a desktop computing system, component architectures make life a lot easier for designers, support staff, and end users. A monitor manufacturer can build a variety of monitor sizes and types as long as they all interface with computers in the same way. IT support can set up new computer systems quickly, and if a printer runs out of paper or breaks completely, it doesn’t crash the system.

This is the state of interoperability nirvana that many of us hope to reach in e-learning technology. We want e-learning systems to plug into the enterprise networks and be up and running in a matter of hours; we want to switch out quiz tools as easily as we change monitors; and we want a failure of any one component to be contained without bringing down other components. To get there, standardization is needed.
The role of standards

It is well and good to break up a complex system into interoperating components, but we have a problem if two systems have different views of what these components are. We also have a problem if we agree on the same components, but they don’t communicate in the same way. In other words, we need to standardize a basic, underlying architecture that defines the important components of an e-learning system and the interfaces among them.

SCORM (www.adlnet.org) takes a step in the right direction by cleanly separating learning content defined ways for e-learning systems to access those services without needing to know how the services themselves are implemented. Initial efforts are focused on basics, such as the ability to store and retrieve a file or the ability for a system to verify that a user ID and password are valid. The next step is to do the same for educational services like learner enrollment or recording a quiz score.

OKI is working closely with the Advanced Distributed Learning initiative’s SCORM developers and with the IMS Global Learning Consortium (www.imsglobal.org),

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from the systems that deliver the content and by defining standard ways for learning content and delivery systems to communicate. However, most e-learning specifications and standards define only the data that can be communicated between components and have not addressed the issues of where and how the communication is to take place. To use the analogy of language, e-learning standards have defined some nouns and adjectives—it is now time to specify some verbs and grammar.

The good news is that several standards initiatives are now moving forward with an architectural approach. This is particularly true of the Open Knowledge Initiative (OKI) (http://www.mit.edu/oki) that has been working for almost two years to define a set of interfaces based on an architectural view of e-learning. The OKI project views an enterprise platform as providing a set of common services and has which is developing an abstract learning framework based on the work of OKI and on other projects that have taken architectures as their starting points.

Indeed, it seems that the international standards community is moving en masse toward the realization that a widely accepted component e-learning architecture is needed to solve the simple and legitimate expectations of e-learning consumers. Since it’s hard to see how e-learning can reach its potential until this happens, this movement toward e-learning architecture standards should be viewed as a positive development for the field.

“...and much more!"

- Davee K. Webb, Training Specialist SPAWAR

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