Building “Open” Frameworks for Education

The past two years have seen a dramatic upsurge in the preoccupation with “platforms” and systems for supporting course administration, class management, and online education. These systems have certainly been useful in raising the floor for faculty participation in online education. They have served primarily as engines for the masses in encouraging faculty, via relatively easy-to-use tools, to take steps (baby steps, in some cases), in using the Internet to enhance the classroom experience. This is important, and these all-in-one environments will likely continue to fill an important role for some time.

But as we move forward in a world of ever-increasing technological diversity and complexity, the current products will likely continue to grow larger and more intricate as they incorporate new features and engulf what were once distinct tools. In addition, the current online learning systems are limiting; they fail to represent the richness and dynamism of educational practice and, consequently, constrain the capabilities and services that are actually needed. We are thus learning that the educational technology systems of the future must be built from the perspective of enterprise infrastructure and must also have open frameworks as their technical substrates. An open-source, enterprise approach—with an architecture that enables systems to thrive and grow.

Architecture That Enables

Educational applications and solutions have typically been localized in their orientation in that their value is realized differently in different contexts. Their development has also been inefficient and constrained because they have been able neither to leverage nor to integrate with existing enterprise systems. Our educational technology systems must be able to derive maximum value from the surrounding infrastructure.

We also must understand that the systems required to support education are mission-critical and foundational. No longer are such systems on the periphery of an institution’s activity; they are becoming central, and their import may soon rival or exceed that of the various campus administrative information systems. With their need for integration and interoperability, common data definitions and standards, availability, reliability, and perhaps investment too, these enterprise systems for education have the same flavor and impact as enterprise systems for administration.

Administrative systems development now supports and encourages well-designed local (“shadow”) systems through the delivery of enabling technologies and services. These enabling technologies provide central frameworks and tools to help managers of local systems make appropriate, effective, and secure use of institutional resources. Examples of such enabling systems can be found in the data warehouses and authorization (roles) directories that are becoming the norm on most campuses.

Today we are faced with a dizzying array of exciting educational technology initiatives and projects, many of which involve local development efforts that reinvent core services to build pedagogically interesting applications. In some ways these efforts might be considered educational shadow systems. As in the case of administrative systems, the educational technology systems of the future must find ways to enable and add value to these local activities.

The architecture of learning-management systems must support the development of diverse, customized tools in the support of discipline or pedagogically specific needs. These tools must link with critical resources such as the emerging digital library repositories, integrating these essential academic resources into online learning systems. Such architecture will promote both innovation and customization. It will allow various campus entities to provide resources and services to their constituents in value-added ways. For instance, professional schools often provide educational resources that are separate from and sometimes overlap with the services provided for undergraduate programs at the same institution. Furthermore, specialized approaches will likely increase as, for instance, teaching programs in engineering begin to adopt technology approaches significantly different from those used in the humanities. An enabling architecture and approach would allow an institutional entity, such as a school of medicine or school of business, to provide special academic services in value-added ways to its constituents. Why, then, impose centralized, monolithic systems?

Architecture That Endures

We must also be careful not to design the architecture too narrowly as we support diverse educational solutions. The fundamental frameworks for supporting educational applications, whether simple
that will provide standard course-
tal Web-enabled learning components
important roles in defining the architec-
ture for learning-management sys-
tive (OKI) (http://web.mit.edu/oki/).
Funded in part by a grant from the
Andrew W. Mellon Foundation, OKI aims
designed, is the Open Knowledge Initia-
tion (OKI) (http://web.mit.edu/oki/).
Funded in part by a grant from the
Andrew W. Mellon Foundation, OKI aims
to provide continuity. This is perhaps the
key promise of the OKI approach and sup-
ports the central idea that online educa-
tional systems should enable good peda-
gogy by supporting the broadest-possible
range of development activity.
OKI's architecture and open source
approach is designed to encourage both
the partner institutions and, later, a much
broader community to contribute tools
and services to OKI's code-base. When-
ever possible, OKI will look toward exist-
ing or proposed industry tools, open
source solutions, and consortium-
developed standards. Thus OKI is part-
nering with existing communities and
movements, including the Instructional
Management System (IMS) Global Learni-
ing Consortium, the work of the Advanced
Distributed Learning Network (ADLNet).
Like all good architecture, OKI is designed
to be spare and elegant and yet provide the
hooks and services that will make it a fer-
tile environment for academic developers.
Although OKI is designed to promote
the development of pedagogical applica-
tions that facilitate the management of
learning content, it is not about the
creation of content and course materials or
the population of content repositories.
That is the focus, rather, of MIT's Open
Courseware Initiative (OCW) (http://
web.mit.edu/ocw/), another Mellon-
funded initiative. The goal of OCW is to
make the course materials that are used in
the teaching of virtually all of MIT's
courses available on the Web, free of
charge, to any user anywhere in the world.
In promoting a vision of a world in which
the course materials of higher education
institutions are a shared global resource,
OKI and OCW are complementary efforts.
OKI will produce the open architecture,
technical standards, and sharable software
to ensure interoperability among the dif-
ferent platforms whereby institutions can
publish course materials on the Internet.
OCW will represent an immense reposi-
tory of course materials that use the OKI
framework and adhere to OKI standards.

Concluding Thoughts
Learning-management technology systems
are emerging as the new component-based
enterprise systems of higher education.
Their success will require an open fram-
work to provide an extensible infrastruc-
ture for building educational applications.
Success will also require an open distribu-
tion model to fuel the support and encour-
agement of a vibrant development commu-
ity from both education and industry.

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