

MITConnect

Building a Modern, Integrated Educational Service Landscape for MIT

It is clear the next generation of educational services for MIT will be based on a technology landscape that includes growing numbers of educational applications, services and content sources across a variety of platforms. These must not simply co-exist, but should integrate meaningfully in support of the complex and changing needs and goals of various educational activities across the Institute.

There are three fundamental technological enablers for realizing this vision:

- 1) Core Educational Services
- 2) Service Integration Endpoints
- 3) Educational Application Environments

For the time being we are calling this vision "MITConnect". The idea behind this name is that the next generation technology environment that MIT creates and supports would encourage and facilitate the connection of the various tools and systems our faculty and students are using for education across the Institute.

1) Core Educational Services

Both OEIT and IS&T are developing and supporting enterprise services that will ease integration between educational applications and with MIT data and systems. An example of a service with which most of our community is already familiar is Touchstone, MIT's single sign-on infrastructure that can be used to integrate MIT authentication services with web-based educational systems. But while enterprise authentication is a fundamental and critical service for educational technology, there are many other services of higher function that are needed to support the MITConnect vision.

IS&T's Education Systems Group and OEIT are already working separately on developing important educational services:

- The Education Systems group has presented its educational service roadmap, which includes the development of a Modular Service Framework composed of set of integrated web services modules that enable critical functionality such grading, student attendance, student photos and calendaring. The first of these, the Gradebook Module, is being piloted in Fall 2011, with launch planned for Fall 2012. Development of an Attendance Module is also in progress as of Fall 2011

- OEIT is developing services to support content discovery and curricular topic modeling, and is preparing to move to services related to various aspects of assessment (quizzing, testing, question analytics, adaptive systems, etc). Current efforts are focused on developing a Learning Objective service in support of a number of activities at MIT, beginning with Professor David Pritchard's introductory physics projects and Crosslinks, led by Professor Haynes Miller.

A collection of educational services like these will provide a foundational core for many of the kinds of educational applications that our faculty and students are adopting or have otherwise expressed a need for.

In addition to those that are already being developed or planned, both organizations have identified the need for an *educational role service*. This service would allow our faculty and teaching staff to manage user roles (student, TA, author, etc). The two organizations are prepared to work together on specifying and potentially developing such a service.

The immediate need for this service is for managing authorization and access control across multiple educational applications, but it will also serve as foundational functionality supporting of many of the higher level services being planned and developed by both organizations.

OEIT, in pursuit of the MITConnect vision, requires an educational role service to obviate the need for teaching staff to manage access control by hand in a growing number of applications at MIT including but not limited to Moodle, Wordpress, Piazza, LON-CAPA and MediaWiki. Likewise, IS&T's Modular Service Framework also relies upon a robust role-based service to facilitate integration with and interaction between the modular components that compose the framework.

2) Service Integration Endpoints

The purpose of developing and supporting a set of core educational services is to make them available to the MIT community to be consumed by educational applications as needed. In this way, central educational technology organizations at MIT can more efficiently and sustainably address the growing variety of applications and services in use at the Institute. This will require not just developing service infrastructure, but also providing openly published, documented and standards-based service endpoints. By focusing support on these connection points, through developer documentation, training opportunities and professional services, we can help our community and third-parties to integrate their own technology choices with MIT core services.

In addition, MIT must define service endpoints to which third-party educational applications can similarly expose basic functionality to be consumed by others if they so

choose. An example of this might be a system being run by an MIT DLC that exposes messaging services for class announcements. We can imagine that this is the kind of information a central student portal or gateway may wish to consume as a service.

3) Educational Application Environments

OEIT and IS&T's Education Systems Group also agree on the need for a browser-based application environment that will host applications of discrete functionality that could eventually replace much of what is currently considered basic "LMS" functionality.

To this end, the Education Systems group is planning to evaluate Google Apps for Education (GAE) as part of a two-pronged investigative exercise whereby IST (1) implements a pilot program for faculty to experiment with certain GAE components and (2) sets up a development sandbox in order to determine the viability of integrating a selected set of GAE components with the MSF framework of learning management web services.

In general it is agreed that MIT's Educational Application Environment should have the following attributes:

- It should support well-recognized "widget" standards to leverage market developments and promote application sharing and re-use.
- It should allow our faculty and students to configure and populate the applications in personal collections and should support users to move applications to other compatible platforms as they wish.
- It should support a federated service plug-in architecture making it possible for application widgets to access and manage data in and across a variety of back-end systems, like multiple LMS platforms or content systems
- It should be aligned with emergent directions of educational delivery systems among colleague institutions ("beyond the LMS" directions such as those at Cambridge University, Stanford, Open University Catalonia, etc.)
- The underlying technologies should be developed in accordance with a unified design framework that incorporates multiplatform compatibility across mobile devices, tablets, and desktop environments.

OEIT and IS&T are also prepared to explore new approaches to meet the expressed need of many in our community for a one-stop "portal" or "landing page" for aggregating the educational experience. We believe that such environments should not strive to contain all educational functionality of interest to our faculty and students. They may be expected to be designed as thin aggregators that expose core functionality to our community, exhibit some level of end-user customization, and serve as a jumping off point for access to other higher function systems or applications required for more advanced educational activities.

