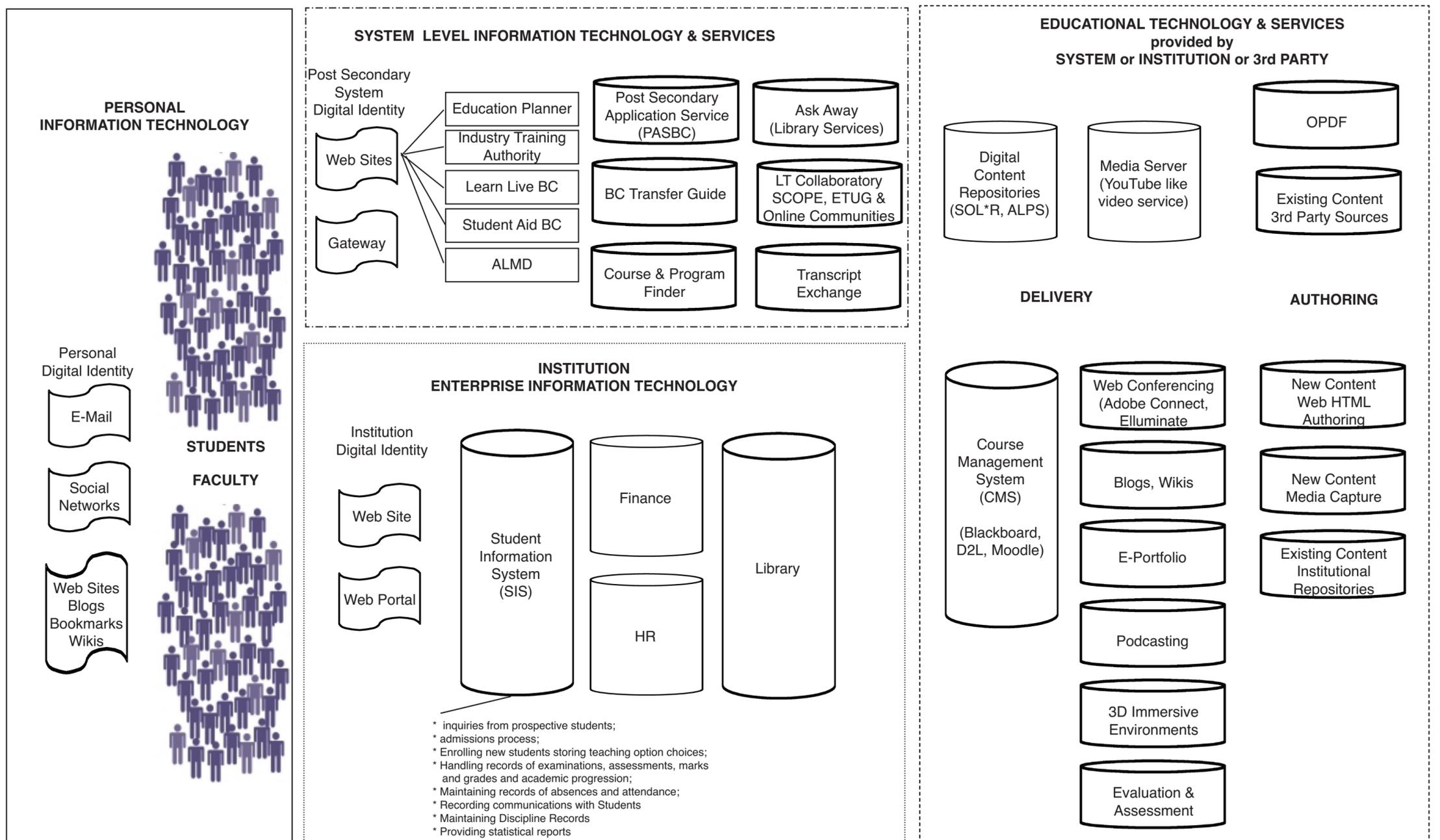


Architecting Extensible Digital Learning Environments

Paul Stacey, BCcampus, April 17, 2009



This educational technology architecture diagram has been created based on starting diagrams provided by Scott Leslie and Michelle Lamberson.

The objective of this diagram is to show how educational technology infrastructure environments can be constructed by drawing on four sources.

1. Students and faculty arrive with their own technologies made up of things like e-mail accounts, social networks, blogs, wikis, digital photo collections and other components representing their digital identity and network of connections.
2. Institutions provide enterprise technology. The primary components all institutions are providing are largely Student Information Systems, Enterprise applications for things like HR and Finance, and Library ICT. All institutions are also creating an institutional digital identity through a web site and/or web portal. Depending on the institution other educational specific technologies may also be supported in house such as course management systems, assessment and evaluation applications, authoring applications, repositories, ...
3. BCcampus and other system level partners provide shared service technologies for the entire system. Good examples of this are the Provincial Admissions Service of BC (PASBC), SOL*R, BCCAT's Education Planner and credit transfer applications, Ask Away Library system, the BCcampus connector system and shared service applications such as Moodle, Adobe Connect and Desire2Learn. Ministry and system partner web sites create macro digital identity for the entire post-secondary sector.
4. Third party providers, either application service providers or cloud computing service providers are also providing technologies on an institutional or multi-institutional basis.

Every institution must make decisions around how to integrate these four sources of technology into a comprehensive digital learning environment. Initial efforts largely focused on providing as much of the digital learning environment as possible in-house. This approach is increasingly constrained due to the growing volume of academic services and course/program areas that are going online, the increasing expectations of students for digital service, and the expanding diversity of educational applications available to support a rich array of pedagogical approaches and teaching/learning experiences. Costs and human resource support limitations are limiting the extent to which all of these developments can be supported in-house. As a result there is a growing need to look at which elements of the digital learning environment can be provided through the other three sources.

The biggest potential rests with Shared System Level ICT and Services. Shared educational technology ICT services typically reduce software licensing, provisioning, and support costs by aggregating system wide demand and negotiating system wide licenses and services. As an incentive for participating in these shared services BCcampus underwrites a portion of the costs associated with its provision leaving institutions to only cover costs associated with their own use above and beyond the BCcampus supported base.

Shared Services Roles and Responsibilities

BCcampus

- In facilitating system-wide Shared Services BCcampus responsibilities include:
- respond to requests for services from post secondary institutions
 - communicate shared service requests out to all post secondary institutions and asking for expressions of interest in participation
 - define service offering/parameters
 - negotiate software licenses, hosting services (hardware), tech support, help desk, maintenance & upgrade fees, professional learning opportunities
 - provide base system-wide level of financial support for service provision that allows all participating institutions to pay incrementally beyond base level based on scale of use
 - support standards-based creation of interfaces and integration with institutional information systems using BCcampus connector system
 - participate in the development and provision of pass-through authentication to enable service access
 - support provision of networking and communication for collaboration, coordination, and communication between service participating institutions, BCcampus, and Service Provider. Support strategic planning and agreed upon approaches to upgrades and evolution of service.
 - maintain FOIPOP privacy policy
 - track usage, gather feedback, measure effectiveness, and report out on results

Participating Post-Secondary Institutions

- Roles and responsibilities of participating post secondary institution include:
- initiation of requests for services and defining parameters of need
 - responding to shared services calls for participation
 - provide incremental funding to support beyond base level use
 - develop interfaces and integrate with institutional information system (use BCcampus connector system wherever possible).
 - implement (if desirable) pass-through authentication to enable technology access using institution identity management system
 - develop/implement institutional customizations
 - create institutional branding/custom look
 - support service provider provision of professional learning opportunities
 - participate in networking and communication for collaboration, coordination, and communication between service participating institutions, BCcampus, and Service Provider. Support strategic planning and agreed upon approaches to upgrades and evolution of service.
 - track usage and report out on measures effectiveness

Shared Service Provider

- Roles and responsibilities of shared service provider include:
- working with BCcampus to define service offering parameters to meet institutional needs
 - negotiate agreements with BCcampus for provision of service
 - provide post secondary participating institutions with services for software, hosting (hardware), tech support, help desk, maintenance & upgrades, and professional learning opportunities as defined in agreement
 - install and operate service as per agreement
 - support use of Application Programming Interfaces that allow for integration and customization
 - configure service to be scaleable and reliable
 - communicate and coordinate maintenance and upgrades with BCcampus and participating institutions
 - participate in strategic planning with BCcampus for evolution of service

The Tower and the Cloud talks a lot about digital identities of institutions. You'll see I've incorporated that idea into the diagram and added the digital identities of students/faculty and the idea of a system-level post-secondary system digital identity.

The diagram is intended to depict how higher education learning architectures are created by an amalgamation of institutional provided technology, system wide technology services, and student/faculty personal learning technologies. Exclusion of any one of these entities results in only a partial representation of learning environments.

A key idea is that an extensible architecture that can support a highly flexible and configurable digital learning environment. If and when the focus shifts to the student/faculty personal information technology we can begin to explore the concept of multiple personalized environments and better include personal blogs and wikis along with cloud tools such as Facebook and Twitter in teaching and learning.

From the faculty perspective adding the research component to the mix is another interesting component. At this point the diagram excludes research focusing exclusively on digital learning environments for teaching and learning piece and not encompass research.