
Chapter 5: Central Services: SIS Replacement Project, E-Commerce, Printing, and Software Licensing

Central services are a collection of IT services that affect a wide range of campus constituents and can effectively and efficiently be provided and/or coordinated centrally. Central provision may come from the University System through the department of University Management Systems (UMS) as well from Information Technology Services (ITS), the Boulder Campus central IT unit. When determining whether to provide services centrally or more locally at the school, college, or department level, considerations such as access to sensitive data, duplication of effort, and degree of customization must be made. Regardless of service provider, the most effective services will be provided when all stakeholders collaborate on their needs and coordinate their efforts.

This chapter calls for substantial and ongoing Boulder Campus participation in the replacement project for the University System-provided Student Information System (SIS). This project will unfold over the next several years and will have widespread impact on campus departments, faculty, staff, and students. The implementation should be consistent with the campus IT architecture and integrate effectively with related services including the campus learning management system. Recommendations from other sections in this chapter call for developing an electronic payment policy and a process for approving the acceptance of credit cards; and developing and implementing an efficient and cost-effective solution for student printing. The last section recommends further coordinating the purchase of software tools, aggregating software licensing, and improving communication about software availability in order to reduce inefficiencies in software purchasing.

5.1 SIS Replacement Project

Major Issue: The current Student Information System (SIS) was installed in 1988 and a combination of factors, including the end of vendor support and a desire for new technologies, is driving a replacement. The new system promises to deliver real-time data in a flexible manner that enhances services for students, faculty, and staff across all three campuses. The implementation will have long-lasting functional, organization, and technical impacts that demand strong participation from the campus.

A. Background/Rationale

The Boulder campus has a long history of providing students with access to academic and other information, starting with CULine in the 1980s, PLUS in the 1990s and since 2003, CUConnect. Students now expect 24/7 access to schedules, grades, bills, financial aid information, address update, and much more, but because of the underlying architecture and legacy system, that data is often hours or days out of date, though it may appear to students as being “live.” Advisors and support staff continue to access data through a mainframe interface to SIS which may present data that is out of synch with that available in CUConnect, creating a source of confusion.

The replacement of SIS provides an opportunity to further direct access to data through an information portal and meet the demand for unified and “nearly continuous and real-time access to information”ⁱ through a service-oriented architecture. The relationship with other tools, such as learning management systems, which depend heavily on course, student, and faculty information, must be considered as part of SIS system implementation. Outlying services, such as electronic communication will also be affected by a new SIS.

A student information system is the most complicated enterprise system used in higher education. Each of its thousands of feature will impact one or many campus business processes and touch departments ranging from student services to academic and administrative support. The frontrunners in this space are all powerful systems but it is the years-long implementation that will define the way campus constituents make use of the system. During that period, participation from both campus functional experts and IT/data experts will be needed to shape the service around a coherent architecture.

B. Accomplishments to date

Preliminary research for a replacement SIS began in 2003-04, followed by a project charter in 2005. A pre-RFP phase began in October 2005 to identify processes and requirements. The current timeline calls for release of an RFP in summer 2006, selection of a vendor and contract negotiations in fall/winter 2006-07, with initiation of implementation in July 2007 and roll-out by 2010.

C. Specific Recommendation

The campus must work closely with UMS during the RFP phase to identify functional and technical requirements for the new system. The campus must develop an enterprise architecture that describes how data will be accessed, delivered, and integrated in a

manner that is cohesive and tailored to the needs of the many constituent groups. Upon selection of a vendor, IT resources should be dedicated to the implementation project to ensure the resultant services are delivered according to the campus enterprise architecture and integrate effectively with related services, such as learning management systems and e-portfolios.

D. Resource Allocation

Cost of the project: moderate to high; minimum of 2 FTE; the campus should immediately fund and assign a campus representative to the replacement project to act as a campus liaison, drawing upon campus resources to provide input to the replacement team and to bring information back to the campus; after vendor selection, the campus should fund and assign at least one dedicated IT professional rostered in ITS to act as a technical liaison with the implementation team; additional academic and functional unit representation will be required during the implementation phase as well.

E. Action Plan

Short Term:

- ITS to develop an enterprise data architecture and strategy for integrated and unified delivery of services
- Campus liaison to be funded and assigned to represent UCB during remainder of selection process and through implementation
- SIS replacement project team to select a solution that supports a service-oriented architecture

Long Term:

- ITC to require campus departments to use service-oriented architecture for access to enterprise data (as it becomes available through replacement and upgrade efforts by CU-System)
- ITS to participate in the implementation team and integrate campus applications and services with the new SIS

Timeline:

- Summer 2006 –RFP finished
- Fall 2006 – ITS to develop enterprise architecture
- 2006-2007 – System office to develop service oriented architecture for Boulder campus that interacts with other data sources including central administration
- Summer 2007-2010 – campus to participate in system implementation; campus departments to migrate data exchange to service-oriented architecture

Primary Person Responsible

Bobby Schnabel, Vice Provost for Academic & Campus Technology and Steve McNally, Associate Vice President

Evaluation of Achievement

Quarterly review by IT Council of SIS replacement project status through vendor selection phase; monthly review during implementation phase; annual survey by CIO's

office to determine how campus departments acquire and use enterprise data, with results to be reviewed by ITC and subsequent follow-up by IT Security Office in cases where shadow systems or batch data transfers remain in use.

¹ SIS replacement project charter; strategic business drivers

5.2 E-Commerce (Standards & Policies for Credit Cards, E-Checks, etc.)

Major Issue: CU-Boulder needs to develop and adopt a new framework of policies, standards and enforcement designed to ensure a secure e-commerce environment.

A. Background/Rationale

Handling credit card payments is widely accepted on campus as an effective means of receiving payments from customers. Electronic commerce, in the form of credit cards or fund transfers, are defined as the acceptance of payment where the transaction is negotiated over campus networks and/or the internet, and is generally referred to as e-commerce. However, formal policies, guidelines, and/or best practices are not established, widely disseminated or routinely followed. Since departments are increasingly accepting electronic commerce (primarily credit cards), they must be equipped to handle the issues and the technological considerations that are part of doing business on the web. Recent departmental security breaches highlight the increased risk and level of exposure the campus faces.

The establishment of control measures for e-commerce transactions is necessary to maintain proper security over credit cardholder information. The review process for e-commerce activities is meant to ensure compliance and appropriateness in the following areas:

- a. Alignment with the campus academic mission.
- b. Consideration of and attention to business/financial/licensing issues.
- c. Marketing/communications.
- d. Legal review, contractual arrangements, etc.
- e. Technology/infrastructure integration (most importantly related to security).
- f. Protection of sensitive data, such as SSNs and credit card numbers.

There is significant customer demand for electronic payment for campus products and services (e.g. tickets for the Artist Series and other theater events, athletics tickets, and tuition and fee payments). Electronic payment clearly provides a competitive position for many services. The financial and technical aspects of the campus solution should be developed based upon generally accepted business practices, adopted by the appropriate campus constituencies, and enforced by a designated authority. In accepting any form of electronic payment, a department is assuming a significant responsibility. In the event that a department does not meet its responsibilities to the sponsoring merchant bank, the credit card system, the customer and the university as a card accepting merchant, not only is the department potentially liable, but also the university as a whole may face significant financial risks.

Despite ongoing efforts such as a Web Publishing Policy and Treasurer's Office guidelines, departments have implemented a disparity of payment solutions, most of which did not go through formal business and technical review processes. It has been identified that approximately 60 departments on campus accept electronic commerce in some form, which makes it critical to develop e-commerce policies and procedures.

B. Accomplishments to date

To address the issues of accepting electronic commerce and doing business on the web, CU-Boulder established a review process described in the university's Web Publishing Policy (see <http://www.colorado.edu/policies/webpolicy.html>). The need to address issues created by the absence of a campus-wide electronic payment solution was a key element in the framing of this policy.

The University Treasurer's Office has set up robust and secure methods of electronic commerce and has negotiated financial arrangements and very competitive rates to handle e-commerce transactions. In addition, the office publishes information and best practice guidelines that are meant to ensure that good business processes are in place before a department accepts cards for payments. Most of the requirements in the Treasurer's Office documents are either mandated by law or are dictated by prudent business practices. See <http://www.cu.edu/treasury/policies/CardMerchant.html> for the Card Merchant Policy.

C. Specific Recommendations

- Develop a process to centrally approve the acceptance of credit cards throughout the campus.
- Develop an Electronic Payment Policy with specific statements to include:
 - Departments must use the UCB 3rd party transaction processing vendor, or obtain prior approval if special circumstances require a different process.
 - The business and technological aspects of all e-payment solutions must have appropriate prior approvals as defined by the policy.
- Policies must be formally communicated to campus departments.
- Compliance with stated policies and procedures must be periodically reviewed.
 - Sanctions for non-compliance will result in suspension of e-payment capability and potentially, fines imposed by credit card companies

D. Resource Allocation

Cost of the project: no or little impact. The cost of implementing electronic payment capabilities will be assumed by the merchant department. There will be implications for staff charged with the approval, monitoring and enforcement processes but the incremental costs should be small.

E. Action Plan

Specific Steps:

Short Term (0-12 months):

- Develop and implement an Electronic Payment Policy which guides future merchant activities.
- Identify and contract with a 3rd party transaction processing vendor

Long Term (12-36 months):

- Monitor effectiveness of 3rd party processing model to improve security of electronic commerce
- Ensure compliance by departments with policies

Timeline:

- Fall of 2006 – develop policies; start process of selecting vendor
- Spring 2007 – contract with 3rd party vendor and implement policies

Primary Person Responsible

Ric Porreca, Senior Vice Chancellor and Chief Financial Officer

Evaluation of Achievement

All merchant departments are in compliance with Electronic Payment Policy and card association rules.

5.3 Student Printing

Major Issue: The current printing solution for students on campus (known as CPI) is not financially sustainable and cannot be funded beyond the existing contract with Xerox. CU-Boulder must develop a model for printing that provides a high quality service for students at a reasonable price, and is financially viable over time.

A. Background/Rationale

The current CPI solution was driven by the following concerns:

- a. Printing costs were increasing rapidly, due mostly to increasing volume and use of consumables.
- b. The “free” printing service resulted in undesirable waste (there was no disincentive to needless and wasteful printing).
- c. Printing costs were not being born equitably: heavy users paid the same computing fee as light users, and students were subsidizing administrative use of printing.

The current solution with Xerox did accomplish the objectives of curbing the rapidly increasing volume of printing, reducing wasteful printing, and shifting the costs to those who print the most. However, printing was reduced so much that the fixed costs of the solution greatly exceed the revenue, making the current CPI service unsustainable.

The students have strongly expressed that the base printing quota of the current program is much too low. There has also been some feedback that the print-station card swipe is cumbersome, given that in most cases the print job is being submitted by an authenticated user in a lab. It’s unclear, though, from printing statistics and observed behavior whether this is an opinion shared by a majority of students.

The current CPI solution is scoped broadly so that it may be implemented within the residence halls and campus departments who wish to use it as a cost recovery mechanism for departmental printing. The residence halls have since discontinued use of the service and adoption within departments has been minimal. This suggests that the scope for a central solution with strategic value is limited to printing in labs or other public areas that support computing, and should be focused at students and library patrons.

The contract with Xerox expires October 31, 2006, with an option to extend it up to two years. CU-Boulder can renegotiate the details of the contract before opting to extend it.

B. Accomplishments to date

It has been established as a matter of principle that printing is a *necessary and fundamental* campus IT infrastructure service. Reliable, easy-to-use, high quality printing in for students in labs and other key public locations furthers the academic mission of the campus and is of strategic value. Being able to easily produce high-quality output in convenient locations on campus – and particularly in the student labs – is an *expectation* of our students and contributes to CU-Boulder’s nationally ranked stature as a “wired”

campus. The students have validated this by clearly stating the value they place on convenient printing and have voted with their pocketbooks by allocating a substantial portion of their student fees toward printing in general and maximizing base quota allocations in particular.

The conclusion that printing is an essential IT infrastructure service, and that the primary customers are students, implies that it should be an ITS provided and supported service. Library patrons wishing to print from public access workstations are also key customers and ITS should work with the Libraries to ensure the solution is suitable for library patrons.

ITS has already begun the process of specifying requirements for a campus printing service. ITS has also begun negotiating with Xerox to determine if the Xerox solution can fit the requirements, including significant restructuring of the financial terms.

C. Specific Recommendation

ITS should continue to develop and implement a new campus printing solution with a target of Spring term 2007 for having it in production.

ITS should negotiate with Xerox to determine if a favorable partnership can be established for providing a sustainable solution. If not, ITS should extend the current Xerox contract through December of 2006 while a new solution is developed.

ITS should evaluate the Imaging Services costs of managing the program and understand how those costs apply to an ITS managed and supported program.

ITS should have three main objectives in developing the new solution:

- The solution must be financially sound and sustainable, meaning that the current student fees, plus any printing revenues, plus any library patron printing fees must fully pay for the program.
- The solution should strive to be a user-friendly system, focused on students. Use of the system in multiple scenarios (printing from labs, printing from a personal laptop over wireless, etc.) should be as simple and logical as possible.
- The solution should seek to maximize the annual base printing quota for students.

D. Resource Allocation

Cost of the project: no or little impact (the expectation is that a new printing solution will use existing funding sources for CPI, primarily student fees and cost recovery).

E. Action Plan

Specific Steps:

- Revisit the initial tenets and requirements for printing established for the Xerox RFP; establish their on-going validity in light of our experience with the existing solution.
- Establish a service strategy and reference model for campus printing that is independent of any particular vendor (or in-house) solution.
- Establish any new specific business, functional, and technical requirements for campus printing solution.
- Negotiate new business terms with Xerox
- Make go/no-go decision with Xerox
- Either work with Xerox to implement their solution, or develop a solution in-house
- Transfer responsibility for program management from Imaging Service to ITS

Timeline:

- June 2006: Complete new requirements specification and reference model
- June 2006: Determine whether a Xerox solution can be developed that meets the requirements and fits the business model
- June 2006: If Xerox is not an acceptable long term solution, negotiate a contract extension with Xerox through December 2006
- August 2006: New solution selected and designed
- December 2006: New solution implemented

Primary Person Responsible:

Dennis Maloney, Executive Director of ITS

Evaluation of Achievement:

Careful review of program during Spring 2007 to ensure it is on target financially and that it is meeting functional requirements. Quarterly review of program finances to ensure the program is solvent. Annual review of overall program, with student input, for effectiveness and applicability as a campus IT infrastructure service.

5.4 Aggregated Licensing

Major Issue: The CU-Boulder campus spends huge amounts of money and effort purchasing software licenses in a largely unorganized fashion. The CU-Boulder campus must develop selection criteria for software tools; investigate and identify appropriate products; negotiate advantageous purchase programs; communicate information and best practices to campus users; and provide resources to improve the management of software assets or risk serious over expenditures and major inefficiencies where software is concerned.

A. Background/Rationale

The campus has many computing systems and therefore, a significant need for software products. The campus acquires software products from a large number of manufacturers/developers/vendors who provide a wide array of products, with a wide variety of features and capabilities, technical requirements, and licensing terms. People involved with software licensing on campus must take time not only to identify appropriate products but also to understand complex licensing and purchasing terms, both of which change frequently.

The availability of software tools is critical to the instructional, scholarly, creative, research and business activities of the university. However, many in the campus community are seemingly unaware of existing campus-wide licenses or purchase programs; information about our current programs has not been effectively communicated, advertised or promoted. Improving the processes used to identify, acquire, and manage software licenses will improve software availability while lowering ownership costs.

B. Accomplishments to date

There exists a site license for CUantivirus product which has been widely advertised and installed across the Boulder campus. Further, both the CU Bookstore and ITS have improved the process of advertising and acquiring software tools via bulk purchase agreements. For example, purchasing software from the bookstore, via the CUConnect portal, is easier and more efficient than ever.

C. Specific Recommendations

Improve the processes used to identify, acquire, and manage software licenses, making software tools available to the CU Boulder campus community at the lowest possible cost. Further, increase the communications, advertising and marketing of existing software purchase programs.

D. Resource Allocation

Cost of the project: The cost of creating and maintaining a centrally managed software management office alone along with the actual purchase of appropriate software related to the mission of the campus is expected to be high – over \$80,000.00. The return on investment of such an undertaking could be substantial given the current practices

associated with software purchasing. Further, some of the cost of this program may already be allocated to individual departments spending monies in a distributed manner.

E. Action Plan

Short Term:

- Creation of an advisory board for software management.
- Increase communication, advertising and marketing of existing software programs.

Long Term:

- Staff the software management office
- Develop selection criteria for software purchases; purchase specific software relating to the mission of campus.

Specific Steps

- Creation of a software management advisory board for software licensing, purchase, and management. Participation should include relevant student, staff, and faculty governance committees and would report to the IT Infrastructure Advisory Group (ITIAG). Participation may include representatives from other campuses and/or the Procurement Service Center.
- Creation of a software management office in ITS which would spearhead the promotion, procurement and tracking of software in use on the Boulder campus. In addition the office would promote coordination of software and disseminate information about software selections for use across academic, business, and research areas.
- Create a central information system, probably via a CU web page, where administrators, faculty, staff, and students can examine available software licenses and software purchase options.
- Increase communications, advertising and marketing of existing software site licenses and bulk purchase agreements.
- Develop selection criteria for new software site licenses/bulk purchase agreements.
- Purchase specific software that related directly to the teaching/learning mission of the campus (e.g. plagiarism software, essay grading software, etc.)
- Participate in consortia with other universities to share information and possibly gain advantages through coordinated negotiations with vendors.

Timeline:

- Fall of 2006 advisory board created and increased communication concerning existing software purchase programs begins.
- Spring 2007 creation and staffing of software management office
- Summer 2007 selection criteria for software purchases established; recommendations for software purchases presented for budget approval (to include those software products related to the mission of the campus).

Primary Person Responsible

Bobby Schnabel, Vice Provost for Academic & Campus Technology

Evaluation of Achievement

Review of newly created software management office and advisory board during the 2007-08 academic year. The review of the software management office would be conducted by the advisory board, the review of the advisory board should be conducted by IT Council, and results would be reported to both ITS management and ITIAG for further recommendations and improvement.