Adapting the Established SIS to Meet Higher Education’s Increasingly Dynamic Needs

CDS Spotlight Report

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Leah Lang, Manager, Core Data Service
Judith A. Pirani, EDUCAUSE Consultant and President, Sheep Pond Associates

Overview

This special ECAR research bulletin series highlights findings from the EDUCAUSE Core Data Service, focusing on a small but meaningful slice of data collected in the CDS. These selected highlights are intended to provide context and meaning for CDS benchmarks that may be of especially broad interest, be especially timely, or draw connections between research from ECAR and CDS. The series is featured along with other CDS publications on the CDS website and is now available to eligible ECAR subscribers as part of their subscription.

CDS Spotlight Definitions

**administrative/enterprise information systems:** administrative systems or enterprise resource planning (ERP) systems such as student administration (admissions, financial aid, registration, etc.), financial information systems, procurement systems, human resource systems, payroll, research administration (grants and contracts), and library systems (if supported by the IT organization).

**customer relationship management (CRM) system:** Strategy, business processes, and software for managing and enhancing an institution’s interactions with customers, such as students, prospective students, and alumni; faculty and staff; and current and prospective donors.

**enterprise resource planning (ERP) system:** An integrated suite of administrative information systems designed to support and automate business processes through a centralized database system. In higher education, these systems usually include student systems, financial systems, and human resources (payroll/personnel) systems, as well as data warehouse and planning tools.

**learning management system (LMS):** Software that provides an integrated suite of online resources and communications capabilities in support of traditional courses and that can also serve as a platform for fully online courses. A typical LMS provides a range of activity modules, such as forums, databases, and wikis; facilitates student assignments and quizzes; and enables monitoring of student engagement and reporting of grades. Many LMS implementations are integrated with student information systems.

**student information system (SIS):** Software to manage information about students, including the admissions process, course registration and grades, degree audit, housing, etc., and to provide student self-service functions such as course registration, access to course catalogues, class schedules, grades, transcripts, and so forth.

*Source:* Core Data Service

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This spotlight focuses on data from the 2013 Core Data Service to better understand how higher education institutions approach student information systems (SISs). Information provided for this spotlight was derived from Module 8 of the CDS survey, which asked several questions regarding information systems and applications. Responses from 525 institutions were analyzed. Only U.S. institutions with a designated Carnegie Classification (AA, BA, MA, or DR) were analyzed for this report. In addition, we interviewed six subject-matter experts to gain insights about the current and future state of SISs in higher education.

Student Information Systems: Now and Beyond

At the heart of an institution’s ecosystem of administrative/enterprise systems lies the student information system. This vital system gathers and uses an institution’s student-related information throughout the student life cycle—from recruiting and admissions, through education and graduation, and on to alumni affairs. At a high level, SIS data inform important institutional decisions and are a major component of institutional research and assessment. Tactically, the SIS supports transactional business operations and impacts students’ satisfaction and perception of the institution. For example, the SIS may either facilitate a quick and easy 24/7 online course registration process or be the foundation of a process that results in long wait times at the registrar’s office. As today’s higher education becomes increasingly dynamic, institutions face more pressure and challenges in maintaining optimal SIS operations:

- **From back office to forefront:** SISs tended to function as back-office systems, designed primarily for staff and administrators to do their jobs efficiently. Today’s DIY culture, which holds that efficiency and control are best, has students and faculty clamoring for the removal of the middleman. Now we see institutions enabling students and faculty to access the SIS to conduct daily institutional affairs without going through a third party (i.e., the registrar). Thus, this traditionally back-end system now comes to the forefront, and the SIS—the design, ease of use, and touch points—now has to consider the needs of the casual as well as the power user. The fact that the SIS has become a student-facing service even presents an opportunity for the institution to make a strong impression about the priority it places on technology.

- **From staid to agile:** Another issue is how nimbly the SIS can react to unanticipated needs. New regulatory and academic accountability requirements mean the SIS must function in new and different ways—collecting and administering new types of information (e.g., student performance, persistence, and graduation information) in more restrictive conditions (e.g., the Family Educational Rights and Privacy Act). New institutional initiatives, such as a different registration process or a new online program initiative, might similarly require changes in SIS operations.

- **From traditional to new:** Institutions with an older, homegrown SIS may confront long-term maintenance issues, finding it harder to replace retiring developers and system administrators with new staff who are proficient in older programming languages. Over time, the situation could become untenable, forcing the institution to explore SIS alternatives.

Making a change can be tough, however. The SIS is ingrained in many aspects of institutional operations and interacts with many administrative and enterprise systems. Given the numbers of interdependencies, institutions are hesitant to replace or convert SIS systems. In fact, only 8% of U.S. institutions plan to replace their SIS in the next three years. As the University of West Florida found during a recent SIS conversion, replacing a system could mean replacing, upgrading, or modifying as many as 70 dependent systems in addition to the work on the SIS. This is one reason why the SIS, like other core administrative systems, ranks near the bottom in terms of rate of change (see figure 1). To meet the demands of
analytics and the expectations of users, institutions will need to consider whether to adapt existing systems or transition to new environments.

Figure 1. Characteristics of core information systems

Current Snapshot

According to CDS 2013 data, nearly all U.S. institutions have an SIS. At an average age of 13 years old and with 86% of institutions maintaining at least some SIS customization, these systems rank among the oldest and most customized of institutional enterprise systems. Older SISs and those at large institutions are more likely to be highly customized (see figure 2). On average, each additional year of age is associated with a 5.5% increase in the likelihood of substantial SIS customization. SIS customization appears to be the norm for the foreseeable future as well. Of the 8% of institutions that plan to replace their SIS in the next three years, 80% plan at least some SIS customization.
Figure 2. Extent of SIS customization, by institutional FTE

In terms of market share, the SIS space is relatively homogeneous (see figure 3). Nine in ten institutions (88%) use solutions from one of the top 3 SIS vendors. Implemented solutions vary by institution size. Larger institutions are more likely to have a homegrown SIS (13% at institutions with 15,000 or more institutional FTE versus 7% at all U.S. institutions) or an Oracle solution (41% at institutions with 15,000 or more institutional FTE versus 24% at all U.S. institutions). Smaller institutions are more likely to have a Jenzabar solution (26% at institutions with less than 2,000 institutional FTE versus 6% at all U.S. institutions).

Figure 3. Student information system market share
Future Trends
Due to the wealth of foundational data the SIS contains, future focus on the SIS will be around unlocking and more easily using that data. Trends identified by research, CDS data, and interview participants mirror higher education’s changing user, technological, and educational environments.

Ease of Use and Access Control
SIS expansion from back-office power users to the general populace creates the need for more universal access, from smartphones and tablets as well as desktops and laptops. This requires emphasis on anytime, anywhere mobile access and more intuitive, user-friendly interfaces with familiar app environments, drag-and-drop capabilities, social media integration, and a robust yet nimble infrastructure. The need is recognized. The number two spot on the EDUCAUSE list of top 10 strategic technologies for higher education in 2014 is mobile apps for enterprise applications to access enterprise-wide resources and to conduct enterprise transactions from mobile devices.

The question is how best to reengineer a system that was not designed for this kind of interaction. Access control is just one challenge. One interview participant discussed his IT organization’s strategy of producing many front-end apps to allow access to general SIS services for students, faculty, and advisors while restricting access to the core ERP system for IT and appropriate back-end functional office personnel.

Better Analytics and Data Visualization
Institutional efforts to improve student retention, persistence, course completion, and learning outcomes continue to gain importance. To succeed in these initiatives, institutions must analyze the wealth of data included in their SIS, LMS, and CRM system to understand more about student behavior. The key is how to deliver these data and information in ways that are transparent, uncomplicated, and easily accessible so administrators, staff, and faculty can apply this repository of student information effectively. Indeed, the top-rated 2014 strategic technology according to EDUCAUSE research is business intelligence (BI) reporting dashboards. Institutions can use dashboards to display data visualizations with metrics that monitor business processes as well as activities from enrollment and graduate rates to expenditures to strategic project status indicators. Configuring SIS data to be accessed alongside CRM and LMS data will be critical to putting the right data in the right hands, at the right time, in a way that is easily understood.

More Functionality through Plug and Play
Multiyear, multimillion-dollar SIS projects are becoming increasingly problematic, as administrators question long-term return on investment (ROI) and as available financial resources grow scarcer. Less monolithic SISs offer one response, where instead of implementing one complete system with all the components, institutions will take a more plug-and-play approach consisting of a small, extensible core system that connects best-of-breed solutions (e.g., analytics) modularly via standard interfaces. For example, one interview participant described plugging third-party, cloud-based solutions for advising, early alerts, classroom scheduling, disabled student services, and course registration into his institution’s locally managed SIS implementation. Another interview participant discussed layering a customer relationship management system on top of the SIS, thus blending the CRM’s engagement tools with the SIS transactional information. This enables the institution to keep the SIS as the core system of record while reaping the benefits of a CRM.
**Value Enhancement through Integration**

SIS integration becomes increasingly important not only to address changing requirements but also to take advantage of emerging opportunities. For example, at approximately 10% of U.S. institutions, SISs are managed by a system or district office (ranging from 0% at private doctoral institutions to 41% at community colleges). University systems increasingly have to accommodate the cross-registration, advising, financial-aid, and other requirements of students who attend multiple institutions within the system. SIS integration between system campuses and institutions helps facilitate this popular trend. In addition to the analytics benefits, closer integration between the SIS and the learning management system (LMS) offers a number of operational benefits. For example, it can facilitate processes like automated course setup in the LMS or faculty grade entry in both systems.

**More Delivery Flexibility**

Traditionally institutions hosted SISs on campus, but for some institutions, this approach is becoming increasingly inefficient and exorbitantly expensive. Fortunately, the spectrum of delivery options continues to expand, offering greater cost and control flexibility. Today an institution can host its SIS on campus (as do 89% of U.S. institutions), host it remotely (as do 6% of U.S. institutions), or use a software-as-a-service (SaaS) solution (as do 1% of U.S. institutions). One institution may appreciate the hands-on management of hosting a system on campus, despite the investment of on-site resources and staff. Another institution may choose a vendor SaaS approach that offers better service level agreements, security, and offsite backup than the local IT organization can provide. Between 2013 and 2017, the use of cloud-based administrative enterprise applications is projected to increase from 20% of institutions to 36%. Issues of cost, control, data security, and risk tolerance play into the delivery choice.

**Strategic Planning Considerations**

Given the changing institutional and higher education environments, institutions must decide how long to continue modifying their current SIS and when to implement a new solution. Research and interview participants highlight the following recommendations to help with long-term SIS planning.

**Understand the Entire IT Environment**

Whereas an SIS may be a core administrative system, it is difficult to look at its long-term strategy independently because of its linkage with other systems, particularly human resource, finance, and learning management systems. Developing an enterprise IT architecture ranked tenth in the EDUCAUSE 2014 top 10 IT issues list. An enterprise IT architecture helps institutional leaders understand how to combine these discrete services and systems into a holistic environment that is usable and secure, scales to meet demand, provides for multiple integration points, and can be integrated to provide useful data for decision making.

A business-process library provides a tactical view by documenting SIS-related business processes and the business-process relationship of SIS reports. While documenting process is a common system implementation practice, an ongoing understanding of SIS-related business processes and data flows can help determine long-term planning requirements.
Look at the Dollars and Sense
With the price tag for a new SIS implementation averaging $5.3 million and costing as much $50 million, understanding the underlying cost benefits in keeping or replacing the SIS is critical. Understanding the current system’s long-term maintenance stream (e.g., contracted maintenance, hardware, staff) versus a new system’s ROI helps institutions determine when paying for ongoing SIS maintenance is no longer the optimal choice. Questions to explore: How do the costs change year over year for the current system versus investment in a new system? If maintenance costs are X in five years and a new system will pay itself in Y years, which solution makes sense?

Look Beyond the Financials
Interview participants raised other issues to consider in long-term planning. For institutions where student success and retention are particularly strategic, an analysis of the current SIS’s analytic capabilities and other features to meet student success goals—versus the capabilities of a new SIS—may be illuminating. Other factors that emerged in conversations included replacement time frame, local programming resources, risk tolerance, and institutional control of implementation. These factors can impact long-term planning, including whether to maintain a current system, build a homegrown system, implement a currently available vendor or community source solution, or wait for a newly developed SIS solution.

Standardization vs. Customization
An ongoing SIS planning issue is customization. Finding an SIS that meets an institution’s needs with minimal customization is hard, but following this route as much as possible by molding business processes to the SIS not only facilitates system updates but also promotes greater flexibility in exploring new SIS solutions. This is particularly true for cloud-based solutions for which customization options can be limited. Again, a business-process library is one source to assist in this endeavor.

Involve the Entire User Base
A traditional SIS strategy is to involve the business units in SIS planning and development; students are typically an untapped resource. Their feedback, however, can help identify system requirements. One interview participant suggested harnessing students’ technological know-how to enhance current system operations, such as SIS mobile app development. If IT organizations lack the internal resources, they can harness students’ inventiveness by providing them with the tools to develop SIS applications in a way that protects the integrity and security of the data.

Where to Learn More
- Dodds, Thomas, Steve Fleagle, Laura Patterson, and Eric Denna. “We Built, We Bought, We Shared: The Costs of Administrative Systems vs. the Academic Mission” EDUCAUSE Review 49, no. 4 (July/August 2014).
- EDUCAUSE Administrative IT Program.
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About the Authors

Leah Lang (llang@educause.edu) is Manager of the Core Data Service at EDUCAUSE. Judith A. Pirani (Judith.pirani@gmail.com) is an EDUCAUSE Consultant and President of Sheep Pond Associates.

Citation for This Work


Notes


4. For further reading on this topic, the EDUCAUSE IPAS Summit Report Managing Data Risk in Student Success Systems from February 2014 discusses the opportunities and risks inherent in these systems.

5. Ibid.

