Foundations of Administrative Systems:

Balancing Cost and Value

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Introduction

Administrative computing systems are many things. They are big, interconnected, vital, costly, and, in many cases, nearing their end of life.

Administrative systems undergird virtually all of the routine functions of a college or university, including the essential systems that handle HR, finance, and student services, as well as research administration, and alumni/development. Of 58 administrative systems assessed by the EDUCAUSE Core Data Service, the typical institution has 40 which also must interconnect to exchange data. The result is a complex matrix of systems at a typical college or university. Seventy-five percent of IT expenditures go toward running the institution. While these systems are essential, they do not differentiate one institution from another. With pressure to reduce cost and improve efficiency in higher education, institutions will need to make strategic choices as they renew these expensive systems. One strategy may be to minimize cost. Another might be to redesign

business processes to reduce customization. Still another may be to invest in analytics to get greater value from these core systems.

In 2012, the median finance/HR/SIS system was 11 years old,[1] and many will need to be replaced in the next few years, as the technologies change and support ends for aging applications. A large number of colleges and universities are facing the challenge of how to renew or replace admin systems in the most cost-effective manner possible.

This transition presents an opportunity to revisit the processes that drive administrative costs and to focus resources to advance the institutional mission. Rethinking and redesigning a broad range of institutional processes to increase the value of administrative systems is a daunting task that will take considerable effort. But the potential payoff of more and better services and contained costs, while exploring new partnerships and accommodating fundamental shifts in higher education, can be compelling.

[1] Leah Lang and Pam Arroway, *2012 CDS Executive Summary Report* (Louisville, CO: EDUCAUSE, January 2013), 21, http://www.educause.edu/coredata.

STRATEGIC IMPORTANCE

Higher education cannot function effectively, meet legal and regulatory compliance obligations, or make appropriately informed management decisions without effective administrative services and systems. In a time when many colleges and universities must strive to lower the cost of higher education, the selection of new administrative systems becomes a highly consequential strategic decision, encompassing several key issues.

- **Analytics and business intelligence.** Analytics initiatives may increase the degree to which administrative systems and the data they generate can inform academic and operational decisions, leading to improvements in student success, energy management, and more. This ability to generate business intelligence makes analytics an important new factor in investment decisions.

- **Business process reengineering.** The process of examining and redesigning business processes can uncover opportunities for greater efficiency of administrative systems and processes.

- **Shared services.** A growing number of institutions are pursuing shared services, in which common, nondifferentiating services are shared across multiple institutions, driving down costs.

- **Cloud services.** Administrative tools and infrastructure are increasingly available from cloud vendors, which in many cases can provide greater institutional agility at equal or lower costs.

Examples

The following examples illustrate some of the ways in which colleges and universities are pursuing new approaches to administrative systems.

Arizona State University

Arizona State University has been a pioneer in using technology and information systems not only to improve student outcomes but also to innovate with administrative systems and functions. ASU has developed a highly sophisticated data warehouse, which includes data that has been collected for many years. ASU has developed analytics programs and business intelligence tools that use the "big data" in the warehouse to generate easy-to-use reports and dashboards—as well as a growing range of data visualizations—that have resulted in a series of important benefits. The institution is able to base decisions on reliable data, allowing it to be more nimble and provide better services. ASU's use of analytics and business intelligence (BI) has resulted in better yield from recruitment efforts, increases in retention and graduation rates, and growth in research.

Iowa State University

In 2013, Iowa State University transferred service for 8,000 campus phones to a cloud provider under a shared services program operated by Internet2. Under the new arrangement, ISU's legacy PBX system was replaced with a cloud-based phone service that provided more capabilities along with greater reliability. The university expected to save $600,000 annually with the new service, allowing it to refocus those funds on more strategic efforts.

Loyola University Chicago

Loyola University Chicago redesigned its document management processes and implemented a redesigned workflow in response to a proliferation of systems that had been deployed at the university. As a result of these reengineered business processes, Loyola saw significant reductions in the amount of time needed to transfer documents between campuses, and it saved more than 2,500 staff hours per year scanning and indexing forms.

The institution saw a 74% process improvement, which saved 3.7 FTE annually. Palm Beach State College similarly redesigned its document workflows, resulting in benefits including verification of financial aid in two days, compared to as long as six weeks.

Furman University

For a wide range of campus services, Furman University has turned to cloud products, including Microsoft Office 365, Box, OrgSync, and others. The institution has more than 40 contracts for software-as-a-service (SaaS), and it takes advantage of infrastructure-as-a-service (IaaS) in other areas to save money while retaining the ability to provide needed levels of service. Furman uses Amazon Web Services to host its LMS (Moodle) as well as its mobile site. Cloud-based arrangements like this allow the institution only to pay for usage rather than having to buy sufficient infrastructure to meet the peak demands, only to have those resources lie idle during slower times.

Technology

Finance, HR, and student information systems have traditionally been considered the core administrative systems. Other major functions—including research/grants management, admissions, facilities management, and advancement/donor management systems—often interface with the core systems. Institutional environments can be further complicated by major subdivisions, such as a university hospital or other professional school that requires its own specialized systems with back-end interfaces to the main institutional systems and by myriad additional systems that automate other functions or areas such as libraries, event management, room scheduling, learning management, and business intelligence.

Some vendors provide software suites that include many of the typical administrative functions; other vendors offer highly specialized applications for particular functions. Specialized tools tend to be highly sophisticated, offering considerable flexibility and depth, but the work required to integrate disparate applications into a cohesive system can be very expensive and difficult to change.

Another important factor is the degree to which institutions customize systems. Such modifications can satisfy unique institutional needs, and most colleges and universities have customized at least one of their major administrative systems. But customizations can be expensive. According to an expert panel, "Institutional customization of what should be 'industry standard' processes often frustrates efforts to achieve cost-effective administrative services and systems."[2] Many institutions will have to confront the degree of customization in their systems, the business processes and practices that drove those customizations, and whether they can or should replicate them in new or updated systems.

There are signs that institutions are moving away from customization. Finance/HR/SIS systems with substantial customizations tend to be between four and five years older than similar systems with no customization (see figure 1). Among institutions planning to replace core administrative systems in the next three years, just 13% expect to significantly customize the new system, compared to 35% of their existing systems. Given that only 15% of these systems (finance/HR/SIS) are expected to

Current Landscape

be replaced in the next three years, the overall landscape won't substantially change overnight, but these data provide some evidence of a desire to move away from customization. If this trend continues, and if institutions can avoid ongoing postimplementation customizations, the administrative application landscape in higher education could become significantly less complex in the coming years.

A considerable portion of higher education IT budgets is spent on operational costs, including administrative systems. According to the Core Data Service, 53% of institutional IT expenditures support administration, as compared to 37% for teaching and learning and 10% for research and other activities. Put another way, 75% of IT expenditures generally go toward running the institution, while only 25% is for growing and transforming it.[3] Tackling the costs of administrative systems and the processes those systems automate could free up significant sums for savings and/or redeployment.

The degree to which institutions are able to reengineer business processes has a profound effect on the overall cost-effectiveness of administrative systems and services, yet CIOs' experiences with institutional business practices suggest a readiness gap. The business practices most needed for administrative transformation—continuous improvement, data-driven decision making, and business process optimization—were reported to be effective at fewer than 25% of institutions (see figure 2).[4]
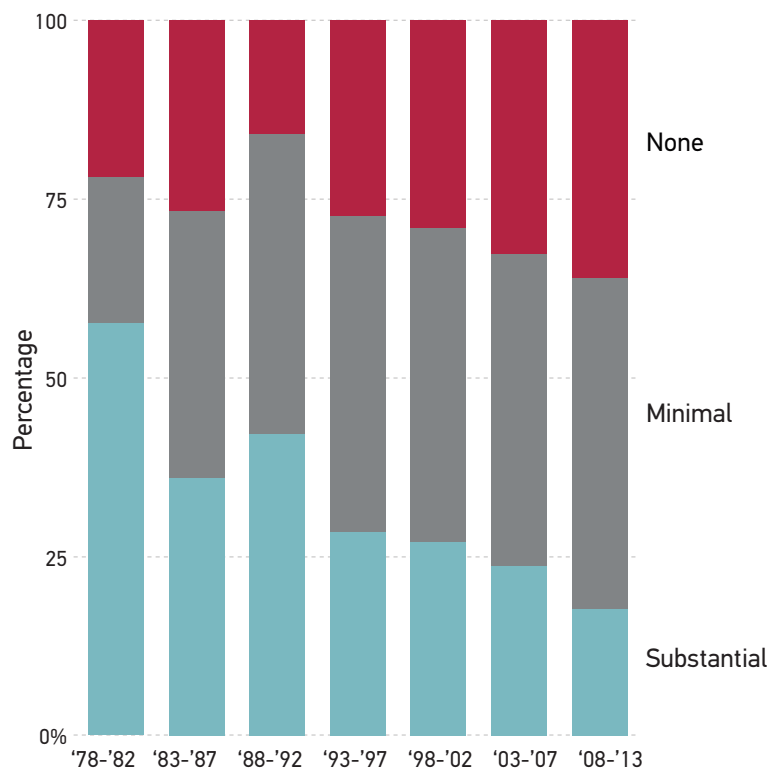
[3] Leah Lang, 2013 CDS *Executive Summary Report*, research report (Louisville, CO: EDUCAUSE Center for Analysis and Research, February 2014), http://www.educause.edu/library/resources/2013-cds-executive-summary-report.

[4] Eden Dahlstrom, *Assessing Your Fiscal Bandwidth: Current Practices for Measuring IT Costs in Higher Education*, research report (Louisville, CO: EDUCAUSE Center for Analysis and Research, May 14, 2013), http://www.educause.edu/library/resources/assessing-your-fiscal-bandwidth-current-practices-measuring-it-costs-higher-education.
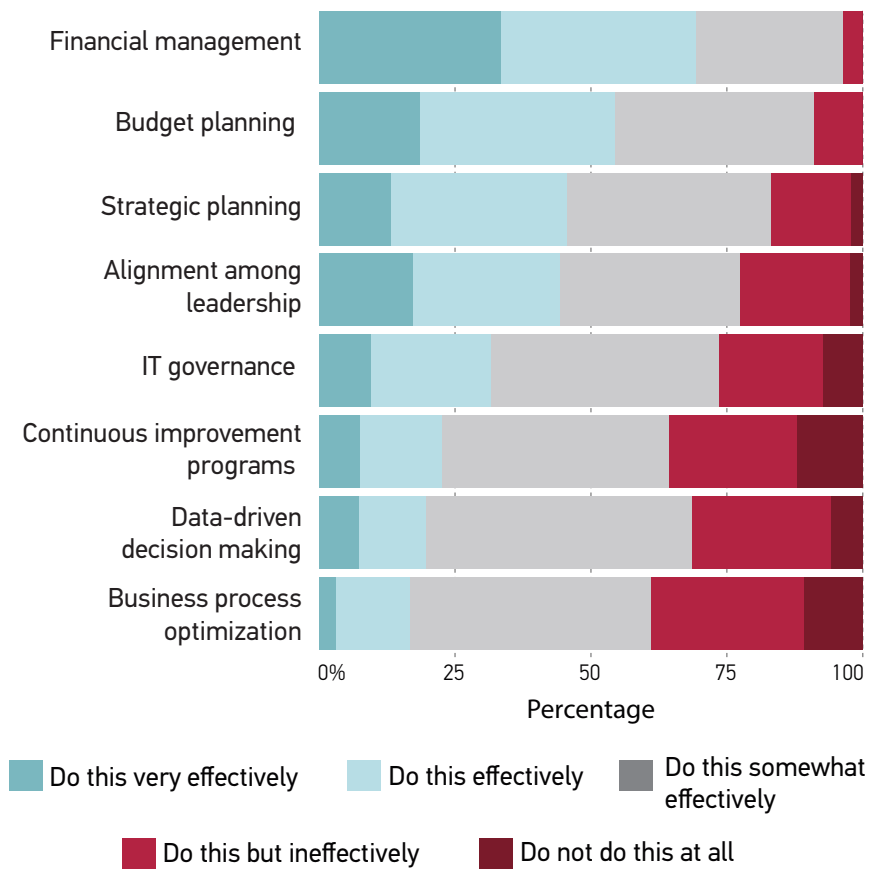

Figure 1. Degree of Customization, by Year of Deployment

Figure 2. Effectiveness of Institutional Practices

The sourcing approach to administrative systems is another important factor. Most systems today are managed within institutions, but cloud computing is poised for rapid growth in this area. Based on reports of current projects,

the proportion of cloud-based administrative enterprise applications will nearly double by 2016–17, increasing from 20% to 36%. That does not include cloud-based e-mail (the most common cloud-based service today), which will be used by as many as two-thirds of institutions by 2016–17, up from 39% today (see figure 3).
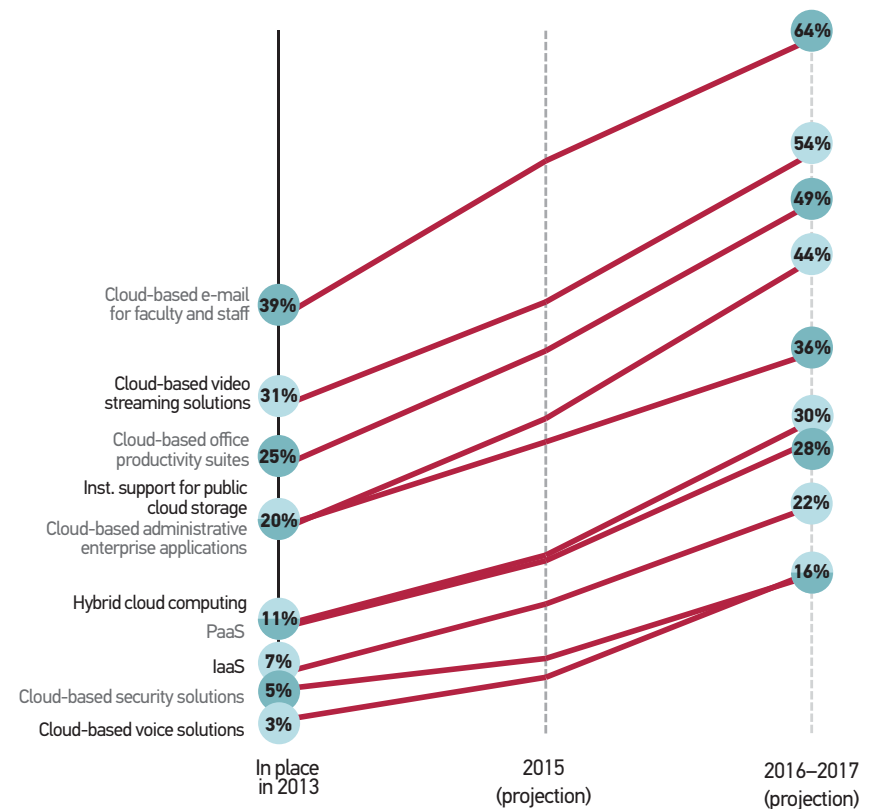

Figure 3. Implementation Estimates for Cloud Technology

Analytics will play a significant role in the value of administrative systems in the coming years, and a large number of colleges and universities are laying this groundwork by deploying analytics technologies. Those technologies dominate the 2014 EDUCAUSE Top-Ten Strategic Technologies list, accounting for four of the top ten:

- Business intelligence reporting dashboards

- Learning analytics: Course level

- Administrative or business performance analytics

- Learning analytics: Degree advising

In particular, business intelligence dashboards are likely to see considerable adoption. Data suggest that their implementation will rise from about one in five institutions today to almost two-thirds by 2016–17. By that time, half of institutions will possess administrative or business performance analytics, which are currently in place at fewer than 20% of institutions (see figure 4).
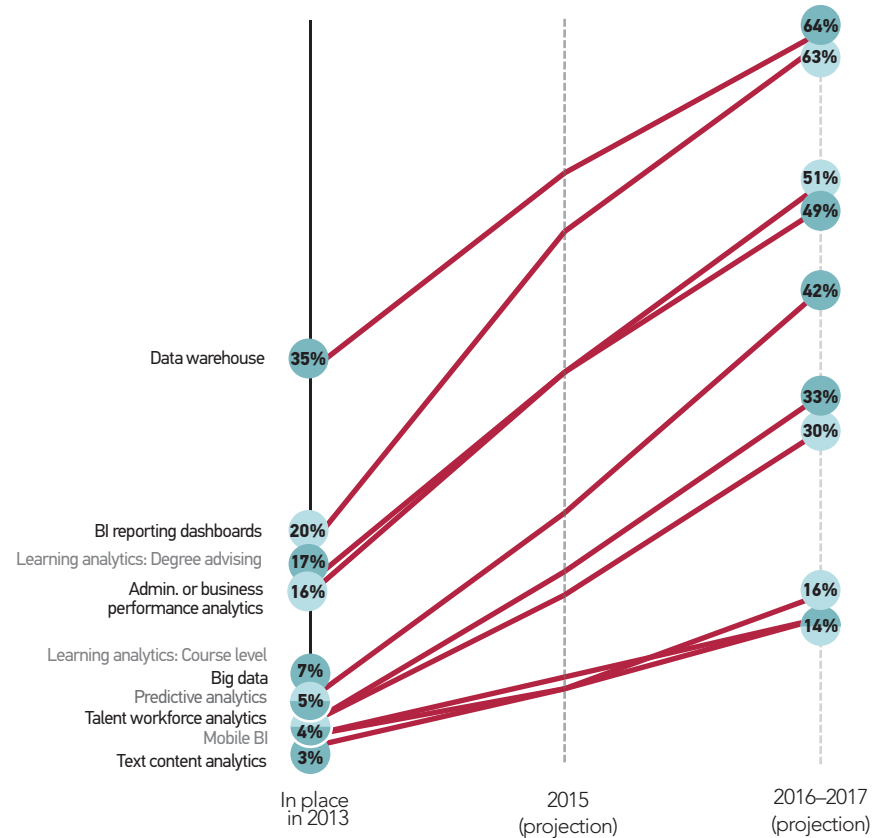

Figure 4. Implementation Estimates for Analytics Technologies

Risks and Rewards

Analytics and business intelligence, business process reengineering (BPR), shared services, and cloud services all hold the promise of helping institutions optimize their administrative expenditures. Each also presents risks that college and university leaders must take into account in considering their next steps.

- **Analytics and business intelligence.** In higher education, analytics uses data, statistical analysis, predictive models, and data visualizations to improve both operational performance and institutional strategy in areas such as admissions, fund raising, learning, student retention, and operational efficiency. Business intelligence is an application of analytics, and insights derived from business intelligence can create a competitive advantage. Business intelligence depends on the data in administrative and other enterprise systems. These programs are at early stages in higher education but are beginning to be used by executives and managers for forecasts, predictive modeling, and resource optimization. Access to large amounts of accurate data allows institutions to understand broad trends, look for causal relationships, and test alternative scenarios as ways of improving decision making.

- **Business process reengineering (BPR).** By redesigning processes, an institution can streamline administrative practices and consider where and how it might make better use of the functionality that its systems offer. This may allow the institution to enhance the efficiency and effectiveness of its administrative services and to rightsize its expenditures, freeing resources to advance strategic objectives or avoiding cost increases. Institutional leaders and staff, however, might not have in-house expertise to implement BPR efforts, which can also make significant demands on the time and attention of senior administrators. BPR will likely create disruption for staff and affected stakeholders, who might be required to let go of old expectations and embrace new, unfamiliar ways of interacting with each other and the institution. BPR is a foundational step to standardize services and systems to function within aggregated solutions, such as shared services and cloud services.

- **Shared services opportunities.** Some colleges and universities are collaborating to provide administrative services to groups of institutions. This trend can be seen at a smaller level within larger institutions, many of which are centralizing commodity services and systems offered by multiple units within the institution. By distributing the costs of service development and delivery across a broader base of users, the cost of these services may decline, while service levels, feature sets, and quality might improve. To be successful, such arrangements face several important challenges, including ensuring that the participating organizations have comparable processes, practices, and expectations and setting appropriate expectations about service levels that will be delivered and how the expected benefits will be measured. Shared services surpasses centralization; it includes a rigorous attention to the discipline of service management and conceives of service recipients as collaborators in defining service expectations.

- **Cloud services.** The delivery of administrative systems over the web might provide another avenue for achieving greater efficiency and effectiveness. High-speed networks allow applications to run over the web as fast and as well as those operated on campus, and cloud services might provide more flexibility and reliability at similar or lower costs. At the same time, institutions must balance the benefits of cloud options for administrative services with concerns about security and loss (or the perception of loss) of control. Developing clear contracts for such services—and managing those relationships— might also require new staff competencies.

Strategies for Institutional Leaders

Weigh commodity versus customization. Understand the trade-offs between commodity services and customization, seeking to meet institutional needs while taking advantage of the cost savings available from new models of administrative service delivery. Be prepared for the cultural changes needed to support new systems and structures.

Prepare. Today's institutions will need to develop new capabilities and new staff skills. These changes may affect groups as disparate as IT, finance, procurement, HR, and institutional research. Administrative culture, organization, and staffing may need to be realigned. There will be implications for academic culture, too, in some of the changed processes and staffing.

Enable future models. Strive for flexibility in administrative systems, which should last 10–20 years. Developments such as competency-based education, online learning, and emerging business models for higher education will be enabled—or hampered—by how administrative systems function, share data, and enable new models of education.

Invest strategically. Replacement system costs include implementation and maintenance. Further investment will be required for redesigning business processes and implementing analytics. Investments can be weighed by overall value to the institution, not just cost. The return on investment is best measured not immediately but after new initiatives have settled in, generally 18–24 months later.

Start soon. Replacing administrative systems is a major undertaking, and because colleges and universities have differing priorities and contexts, no single approach will work well for all institutions. Lessons learned from others can be extremely helpful, but a smooth transition to new administrative systems—poised for the future—takes time.

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