

Information Technology in Higher Education:

2012 Survey of Chief Information Officers

Executive Summary



Leadership Board for CIO's

Dr. Ed Aractingi, Marshall University

Len De Botton, Berkeley College

Dr. Jerome P. DeSanto, University of Scranton

Dr. Jan Fox, Marshall University

Doyle Friskney, University of Kentucky

Dr. Vince Kellen, University of Kentucky

Dr. James Lyall, Metropolitan State University of Denver

Dr. David Rotman, Cedarville University

Dr. Tina Stuchell, University of Mount Union

Dr. Michael Zastrocky, LBCIO

Sponsored by:



The Enterprise Cloud for HR and Finance

Built from the cloud up,
Workday offers the most
intuitive user experience for
an enterprise application. **Ever.**

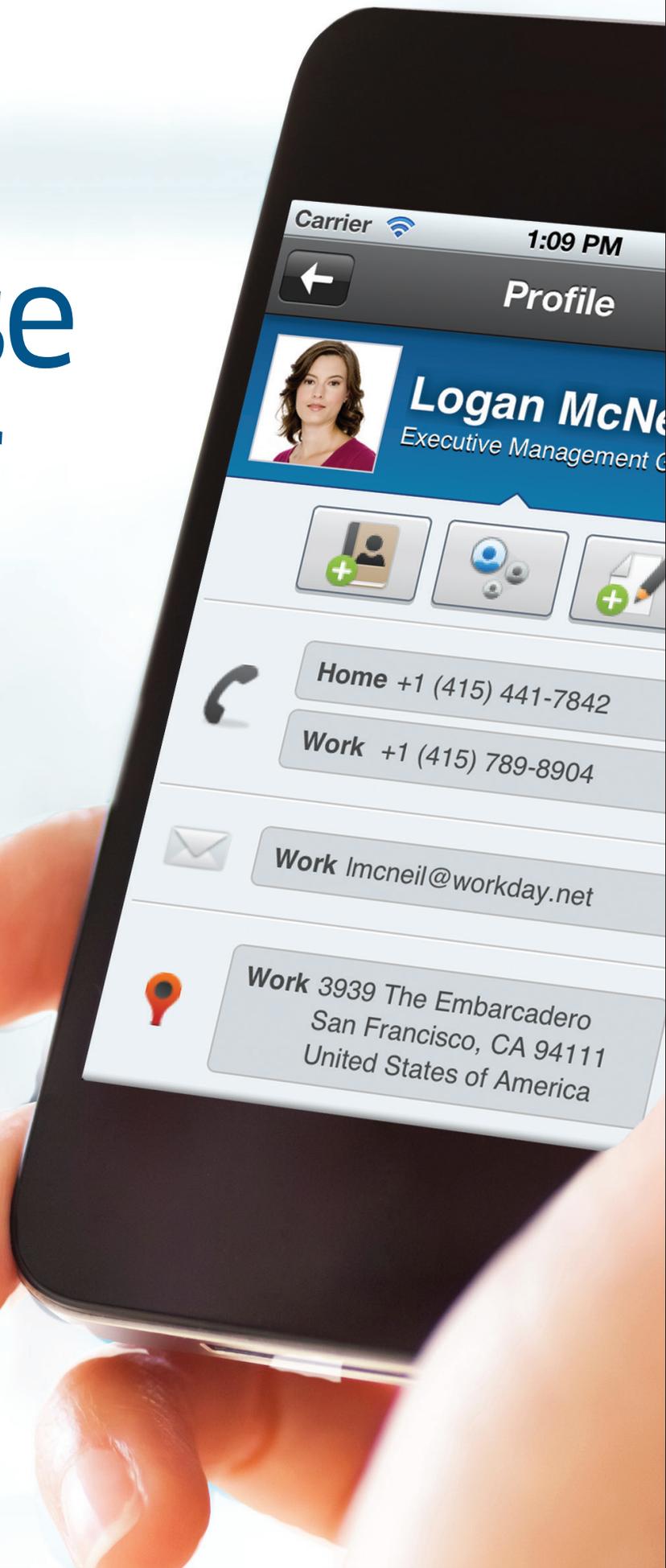


TABLE OF CONTENTS

Introduction

Overview of Results.....	4
Financial and Budget Planning.....	4
IT Organization and Governance	5
Consumerization of IT	8
Administrative Computing	10
Academic Computing	13
Infrastructure and Networking	16
Cloud Computing and New and Emerging Technologies.....	18
Summary and Methodology	22

The entire content in this report, including but not limited to text, design, graphics, and the selection and arrangements thereof, is copyrighted as a collective work under the United States and other copyright laws, and is the property of The Leadership Board for CIO's

Copyright © 2012.
ALL RIGHTS RESERVED.

1271 Cedar Street Broomfield, CO 80020.
Telephone: (303) 807-9408.

You may electronically copy, download, and print hard copy portions of the report solely for your own, noncommercial use. You may not modify, copy, distribute, transmit, display, reproduce, publish, license, create derivative works from, transfer, or sell any information obtained from this report without the express, written authorization of The LBCIO.

INTRODUCTION

Chief information officers (CIOs) in higher education face a daunting task today as they must manage tight budgets, increasing demand for services and support, and a loss of experienced people in the face of retirement or attrition with no replacements. Although information technology (IT) leaders must understand new and emerging technologies, CIOs don't want to get caught making a decision that could be the next "NeXT" computer. (NeXT was the failed computing paradigm promoted by Steve Jobs in 1988, which cost the jobs of a few CIOs who bought into the paradigm.) However, they can't stand still and sit on current and past performances and applications. They are responsible for IT assets that are increasing in value and that support all faculty, staff, students, trustees, alumni, and other constituents. Knowing what peers are doing and thinking about can help CIOs sleep better at night, which is the main purpose for the 2012 LBCIO CIO Survey for Higher Education.

This survey was developed as a global survey to provide CIOs with key metrics to help them do the work of managing and planning IT for their institutions. Results from the survey are shared only in the aggregate, with no cost to members and CIOs who complete the survey. Numbers reported are not meant to provide market research but simply tell the story of what CIOs are currently doing and thinking about for the future.

To get a complete picture of IT on campuses today, the Leadership Board for CIOs surveyed a

broad range of colleges and universities in May 2012 to collect strategic and tactical information on major issues that higher education CIOs face. Survey questions included financial and budget information for IT; organizational and governance questions; personnel and staffing questions; infrastructure and networking questions (including security issues); and questions about consumerization, administrative computing plans, strategic planning for IT, academic uses of information technologies, and plans for new and emerging technology. Dr. Michael Zastrocky, Executive Director of LBCIO, was assisted by the following LBCIO board members: Dr. Ed Aractingi, Assistant Director, Marshall University; Len De Botton, CIO, Berkeley College; Dr. Jerome P. DeSanto, CIO, University of Scranton; Dr. Jan Fox, CIO, Marshall University; Doyle Friskney, Chief Technology Officer (CTO), University of Kentucky; Dr. Vince Kellen, CIO, University of Kentucky; Dr. James Lyall, CIO, Metropolitan State University of Denver; Dr. David Rotman, CIO, Cedarville University; and Dr. Tina Stuchell, Director of IT, University of Mount Union in the analysis of this year's survey results.

The 2012 LBCIO survey added a few questions about CIO demographics and others that were ranked high on the LBCIO list of top issues facing CIOs in higher education in 2012. These include questions concerning the administration and use of student computing fees, more questions on consumerization and BYOD (Bring Your Own Device), and more attention on IT organization, governance, and security.

ABOUT THE LBCIO

The Leadership Board for CIOs in Higher Education (LBCIO) Survey is a project of the LBCIO, lead independently by Dr. Michael Zastrocky. When first fielded in 2010, the survey was a joint effort by Dr. Zastrocky and The Chronicle of Higher Education, Inc. Dr. Zastrocky publishes this global survey to provide CIOs with key metrics to help them do the work of managing and planning IT for their institutions.

OVERVIEW OF RESULTS

Knowing what other CIOs are doing and thinking about brings some degree of comfort and assurance to CIOs as they plan for the future. In this year's survey, we continue to find CIOs grappling with difficult budgets and limited strategies for increasing available resources. We also find that even though CIOs are concerned about "new and emerging technologies," most of what they list are not really new and emerging technologies but rather where they need to invest in the future.

Budgets continue to remain tight as more than 60% of institutions report their institutional budgets decreasing or staying the same. Staffing continues to be an issue for many institutions, as increased numbers of CIOs reported that their IT staff size decreased from last year. Many CIOs are cautiously optimistic about the use of shared services and collaboration to improve life and budgets on some campuses, and movement to the cloud continues to grow, but with caution on the administrative application side. The consumerization movement or BYOD continues to grow, and 98% of CIOs report that consumerization is significantly or moderately affecting their institution. Network expansion continues to plague many institutions, as fewer institutions reported spending money and time on a security audit than in the prior year: 37% in 2012 vs. 41% in 2011. The growth in the use of cloud computing continues, but more with academic resources and applications than financial applications. Overall, the data shows that CIOs face major challenges but seem to be continuing to provide service and support for an increasing number and variety of applications and constituents.

FINANCIAL AND BUDGET PLANNING

The days of cyclical roller coaster budgets in higher education, with several years of budget increases followed by a few years of decreased budgets, appear to be over. In the past five years, CIOs are consistently reporting tight budgets, with fewer reporting overall institutional budget increases; more report decreases or budgets staying flat. At the same time, as institutional budgets remain tight, IT budgets often lag behind the

institutional budget even as many CIOs find demand for IT services and new technologies increasing. In 2012, CIOs at research universities seem to be doing better, with 48.1% reporting IT budget increases while only 28.6% of two-year institutions reported IT budget increases.

- This year, 23% of institutions reported that their institutional budget stayed the same as their prior year budget, while 34% indicated that their institutional budget decreased. In 2011, almost 31% reported that their budgets stayed the same and 29% indicated that their institutional budget decreased.
- Slightly more than 43% of institutions said that their institutional budget increased, which is up almost 3% over 2011 figures.
- Cautious optimism continues, as 70% of institutions expect institutional budgets to either grow (39%) or stay the same (31%) in the year ahead.
- Optimistically, slightly more than 41% of institutions said that institutional budgets grew in 2012, a 7% increase from 2011.

BUDGETS FOR INFORMATION TECHNOLOGY

IT spending is tracking closely with overall institutional budgets. In 2012, almost 59% of the institutions reported that their IT budgets decreased or stayed the same. This represents a 5% reduction from 2011 figures.

- This year, 30% of institutions reported that their IT budgets stayed the same as their prior year's IT budget. In 2011, 42% reported that their budgets stayed the same.
- However, 4% more institutions in 2012 reported a decrease from their prior year budget. In 2012, 29% reported a decrease, compared with 25% in 2011.
- The good news is that since 2010, institutions showing growth in their IT budgets improved from 24% reporting increases in IT budgets in 2010 to 34% in 2011, and 41% in 2012.

Pessimism about IT budgets for the future seems to be greatest at two-year institutions. Only 4.8% expect IT budget increases next year, compared with 39% at four-year institutions, 32% at four-year institutions with master's degree programs, 42% at doctoral-granting institutions, and 46% at research universities.

STRETCHING IT FUNDING

Among the new questions on the survey this year was, “What strategies are being considered for stretching IT funding?” Institutions were asked to select all the strategies that applied. On the top of the list was delayed maintenance or replacement selected by 80% of respondents, while 73% selected shared services/collaboration with other institutions as a means of stretching IT funding. Next on the list was a greater use of open source selected by 52% of institutions, followed by cutting services (41%), and other new revenue selected by 35%.

Delayed maintenance and replacements are still being utilized to stretch available budgets, but this strategy will hit home in the next few years as the backlog of work and failure of old technologies come home to roost. This problem was highlighted in the book *The Decaying American Campus: A Ticking Time Bomb*, published by APPA (The Association for Leadership in Educational Facilities) and NACUBO (the National Association of College and University Business Officers) in 1989. At some point, the cost for deferred maintenance exceeds the cost of continual renewal and replacements. CIOs must be careful not to press too hard on short-term budget savings, which will ultimately cost the institution more in the long run while increasing customer frustrations.

Strategies Being Considered to Stretch IT Funding

Other new revenue streams including increased fees, selling services



Cutting services



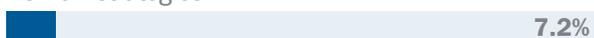
Greater use of Open Source



Shared services/collaboration with other institutions



No new strategies



IT ORGANIZATION AND GOVERNANCE

CIOs face unique challenges created in part by the institutional governance structures and the unpredictable financial environments of the past few years. Recent budget fluctuations are influencing the workforce as well as decisions to outsource certain services. Institutions are not increasing their use of student workers and have been less consistent in retaining or growing full-time staffing levels. Outsourcing and cloud computing continue to grow, but there is a dichotomy in the type and level of institution that is satisfied with these options. Those institutions—which were already outsourcing networking, administrative applications, and lab maintenance/support or project management—were also very likely to consider moving their e-mail and social networking to the cloud. University CIOs regularly find themselves at the nexus of numerous institutional discussions and decisions, many of which are becoming more strategic in nature and include topics that are not normally seen in the CIO purview.

University leaders increasingly look to CIOs to provide leadership and expertise in IT services, but the CIO also must be savvy in a larger spectrum of institutional knowledge and skills reserved for other business units. Business process improvement and strategic planning at the institutional level lead the way for the CIO to provide the most value. The level of educational attainment and the business maturity of the person in the CIO role often influence the reporting hierarchy. CIOs are relying more on IT governance models to aid in the decision making and to involve business unit leaders in best applying IT solutions to business problems. These governance committees are tending to include higher-level university leaders, board members, and even external advisers. Although CIOs consider this input to be very important, the majority still say that the final IT decision should be theirs.

STAFFING

CIO staffing patterns have changed since the 2010 survey. For the past two years, the CIOs reported full-time staff numbers moving from flat to the more extremes. Depending on the institution, almost one-third either reduced or added to their staffs. This differs from 2010,

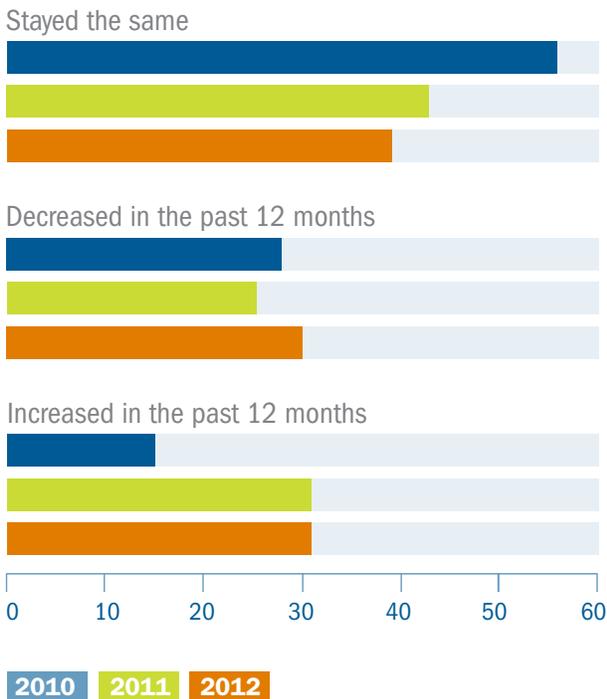
when the majority of IT staffs were the same from the previous year (56%).

In the upcoming year, most CIOs predict their staffs to stay the same (53.4%). Though finances have been difficult for the past few years, more than a quarter (26.7%) of university CIOs reported projecting an increase in their staffs, with only 19.9% predicting a decrease; this was consistent with last year's figure. Just two years ago, only 15% predicted a staff increase, with the vast majority reporting flat (56.4%) projections.

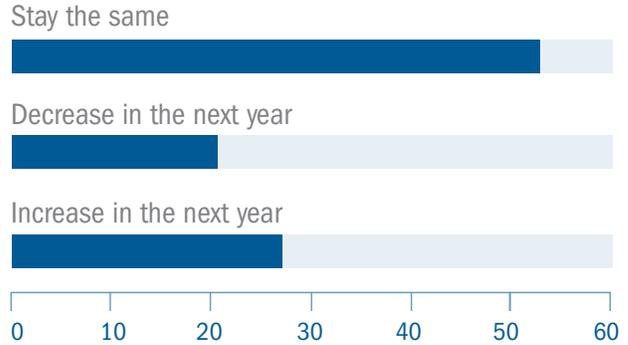
In nearly 60% of IT departments, student workers compose up to 10% of their workforce. Only a small percentage (9.3%) of institutions utilize students for 20% or more of the workload.

Our survey does not show a major shift occurring in IT student workers. For the past three years, most institutions (more than 60%) have predicted zero growth in their student worker population. This trend continues

Has your full-time IT staff:



Do you expect IT staff to:



for next year, with an even larger percentage (67%) predicting the same level of student workers.

OUTSOURCING

More than 81% of the CIOs expect to outsource some form of IT services or support. E-mail/social networking communications lead the way at 84.1%, followed by academic applications (57.4%), web development (38.5%), and enterprise resource planning (ERP) (35.9%). University CIOs are least likely to outsource the university network (6.2%) or security (5.6%).

For those who outsource their central help desk, 52.1% were pleased but 21.7% were dissatisfied. Outsourcing for smaller institutions (up to 3,000 full-time employees [FTE]) was more positive (75%). This statistic may be due to a lack of depth or breadth of expertise normally found at larger institutions. Yet more than a third of institutions, both in the middle and large ranges (5,001 to 10,000, and more than 10,000 but fewer than 25,000 FTE) of students were displeased with outsourcing their central help desk.

Those institutions already comfortable with outsourcing one or more services were likewise comfortable in progressing with plans to move their e-mail/social networking communications to the cloud. A similar association appeared for those who had outsourced their lab maintenance and support (PCs). They were also more likely to progress with plans to outsource their Web development.

What's being considered for moving to the cloud	
Administrative applications (ERP)	35.9%
Academic applications including course management systems/learning management systems	57.4%
Web development/applications	38.5%
E-mail/social networking/communications	84.1%
Networking	6.2%
Security	5.6%

ORGANIZATION

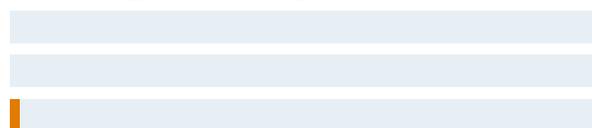
CIOs more often report to the chief executive officer (CEO, who may be a president, rector, or vice chancellor) of the institution than to any other level (33.7%). This is consistent with the previous two years, but slightly fewer than last year. There was some growth in CIOs reporting to the chief financial officer (22.9%). CIOs are finding themselves in more strategic roles and less in operational roles over last year's figures. Those indicating more strategic roles reported to the CEO (79.7%) or chief operating officer (COO) (80%), while the reverse was true (57.1%) for those reporting two levels from the CEO.

In general, university CIOs have a high degree of confidence in their knowledge of a wide range of university operations but feel they need additional understanding of the university competitors. This is more likely to occur for CIOs with the most experience in their current roles, those who hold terminal degrees (86% of CIOs with terminal degrees are satisfied with their familiarity with and understanding of competitors, compared with 64% of those with bachelor's degrees and 68% with master's degrees), and those who report at the highest level.

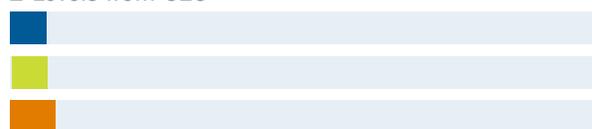
Virtually all reporting institutions indicated the need for some form of IT governance. Governance models are moving to include higher-level institutional decision makers, board members, and external advisers. The increasing strategic nature and importance of technology across traditional and nontraditional IT areas has spurred a new level of interest in all sectors of the campus community. All desire to provide input to the IT priorities and policies.

Where does the CIO report?

More than 2 levels from CEO



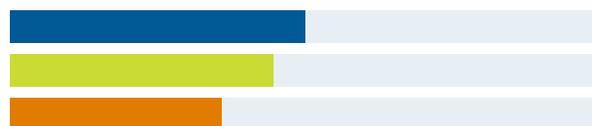
2 Levels from CEO



Chief Operating Officer



Chief Financial Officer



Chief Academic Officer



Directly to the CEO (Pres., Rector, Vice-Chancellor)



In 2012, CIOs most often reported (57.4%) that they rely upon IT governance to aid in decision making, but ultimately the decisions are theirs. Almost one-third of CIOs reported low or no reliance on a governance structure. CIOs consistently report the importance of governance structures as very high or high (73% in 2011 and 2012). More than 80% use high-level committees that set the IT institutional priorities; this is a 10% rise over last year's reported numbers. Twenty-two percent included boards of trustees/directors/governors, and 14.4% included external advisory boards.

Business process and strategic planning were the leading areas in which CIOs reported adding the most value to the institution, 93.6% and 89.7% respectively. The other two critical areas were teaching and learning innovation, and modeling and leading project-management initiatives (74.5% and 71.6%, respectively). As CIOs add value to their institutions, the vast majority (more than 84%) felt very comfortable with their knowledge of the higher-education industry, customers, business processes, and financial issues. Only 71.9% felt comfortable with their knowledge of the institution's competitors.

CONSUMERIZATION OF IT

The consumerization of IT is defined as the introduction and integration of consumer-grade devices and services into the institutional enterprise. Consumerization is becoming more evident with each passing month. It is evidenced by the BYOD movement as well as workers and students extending their consumer experiences and preferences into the typical college campus. Consumerization is synonymous for many with the idea of personalization, where the individual has a strong, unwavering desire to customize or personalize their IT work or learning experience.

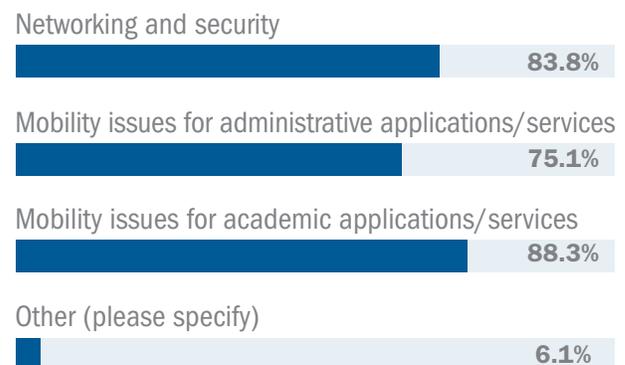
Clearly illustrating this upswing in IT consumerization recognition or impact is the first table, which shows that 98% of CIOs believe that IT consumerization is having a significant or moderate impact on their campus. This is as close to unanimous consent as one gets. In comparison, last year's reported number was 95%, so the issue is not going away; it remains a significant issue for CIOs.

How is the consumerization of IT affecting your campus?		
	2012	2011
Significantly	43.6%	38%
Moderately	54.4%	57%
Not at all	2%	5.1%

When asked how the effects of consumerization were manifesting themselves, CIOs agreed that mobility and security issues topped their list, with consistent ratings between about 75% and 85%. Thus, CIOs are focused on the fact that consumerization is affecting their planning for wireless services and their security posture. We are hearing much more of late about enhancements being needed for campus wireless networks and for launching mobile-device management applications.

Interestingly, when CIOs think about those customers who are most embracing consumerization, students rise to the top of the list, at an average just exceeding 90%. Faculty numbers follow at around 64%, with staff coming in at approximately 50%. This supports the notion that students are introducing a degree of uncertainty to the mix for the CIO, while faculty and staff are somewhat more predictable in their behaviors.

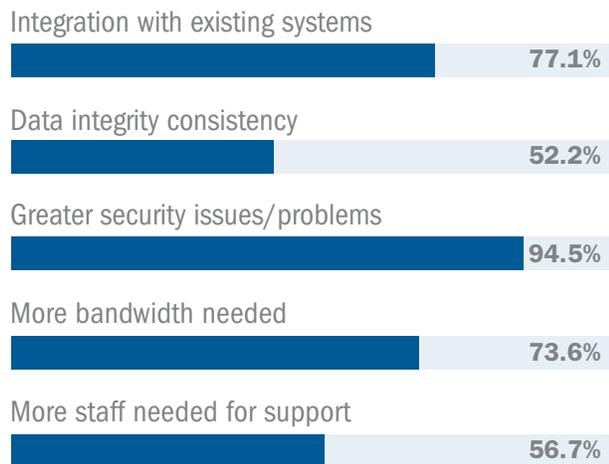
CIO Responses on Areas Affected by Consumerization



Potential Benefits of Consumerization



Top 5 Potential Problems with Consumerization



Early in the onset of the consumerization movement, some thought that consumerization might drive cost savings on the college campus by triggering

Impact on IT Staff Training and Development



the incremental removal or reduction of IT-provided devices. However, to date CIOs are not seeing this as an advantage. Rather, CIOs see the advantages of consumerization residing in intangibles, such as freedom of choice at 78% and competitive positioning for their respective institutions at 48.5%. These numbers track close to 2011 numbers illustrating this point well.

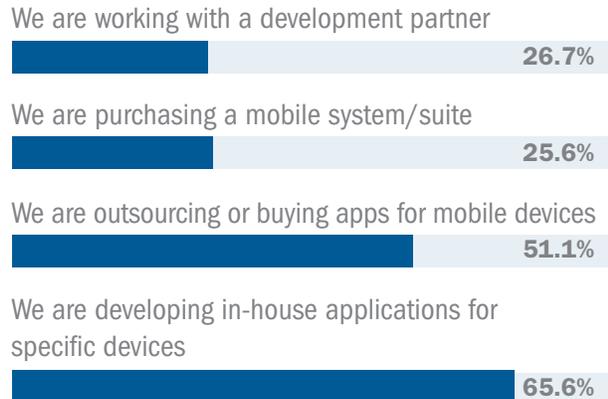
CIOs are quick to cite numerous challenges associated with the consumerization movement. Heightened security issues are cited first at 95%, followed by integration issues at 77%. Listed third are bandwidth issues at 73%. Thus, it follows that IT planning is crucial when it comes to consumerization. For the most part, these percentages track closely to 2011 numbers. However, it is worth noting that bandwidth concerns saw a jump from 62% to almost 74%, which underscores the pressure that CIOs are feeling with respect to their network infrastructure.

CIOs weighed in on how IT consumerization was affecting their staff. The most revealing evidence of this seems to be in the escalating need for staff development to learn how to support the plethora of new devices appearing on campus. The survey shows that almost 70% of CIOs believe that more staff training and development is needed to cope with all of the new devices and applications that consumerization brings. In addition, almost 30% of the CIOs participating in the study assert that they need to recruit new staff with different skill sets to support this new generation of users and devices. This indication begins to illustrate the shift away from the typical desktop support staffing models to more diverse support paradigms that are focused on mobile devices.

New to the study in 2012 is a question regarding the CIOs' commitment to mobile development. Almost two-thirds of the CIOs indicated that their staff is developing mobile applications as part of their mobile-development portfolio. Fifty percent of the CIOs have opted to outsource part of this same portfolio, 25% are purchasing an entire mobile suite of applications, and approximately another 25% are currently working with a development partner. From these responses, it is clear that many CIOs are doing a combination of things with respect to applications, with some insourcing and some outsourcing in this relatively new area of development.

In summary, this section of the survey shows a growing acknowledgment that consumerization is a significant issue that needs to become a key part of a campus IT plan. As with many new IT developments, CIOs see consumerization as a blessing and a curse. It is undoubtedly an unstoppable force to be embraced, with implications that stretch across the entire campus IT enterprise. It is also here to stay.

Concerning Mobile Development...



ADMINISTRATIVE COMPUTING

Colleges and universities continue to make substantial investments in administrative systems. They are important to any higher-education institution because they are responsible for managing institutional business processes and transactions as well as student systems to support enrollment, grading and transcribing, and student accounts receivables. Today, it accounts for the largest segment of the IT budget, and every student, faculty, and staff member on campus uses these systems in some way.

Have universities changed their thinking on administrative systems in the past few years? What are they thinking about for the future? With topics such as cloud computing, BYOD, risk assessment, and security facing today's CIOs, we look at what CIOs consider to be important about administrative systems. This year's LBCIO survey asked questions to gauge what CIOs are thinking about and planning for administrative systems.

ENTERPRISE RESOURCE PLANNING (ERP)

ERP systems have been available to institutions for more than 35 years. They were first put in place to help address problems of running separate systems and maintaining separate databases. Some institutions continue to use these types of applications. A vast majority of those who responded to the survey (86%) use ERP vendor-supplied solutions today for their core administrative applications. Core administrative applications include financials, student systems, human resources, and advancement. According to the survey, only 7% use best-of-breed solutions (which can be a mix of vendor applications and home-grown and/or open-source applications), while 4% use home-grown solutions.

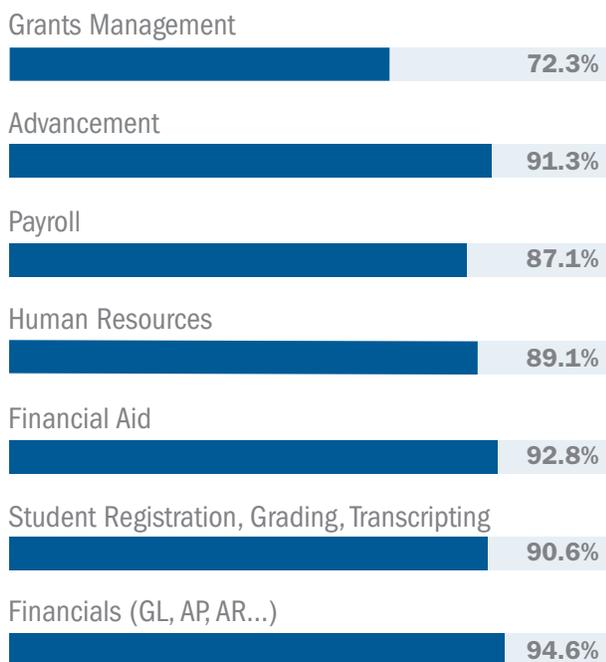
Of those surveyed, 94% use vendor-supplied financial systems, 91% use vendor-supplied student systems, 89% use vendor-supplied human resource systems, and 91% use vendor-supplied advancement systems. Only 3% use home-grown financial systems, 8% use home-grown student systems, 6% use home-grown human resource systems, and 4% use home-grown advancement systems. The data also show that the majority of the

Core Administrative Applications Are			
	2010	2011	2012
Best-of-breed	7.9%	10.5%	7.5%
Home-grown	7.4%	5.9%	5.5%
Outsourced	0.5%	0.7%	1.5%
Open-source	0.5%	0.0%	0.0%
Vendor-supplied	80.2%	80.4%	85.6%

institutions had their administrative systems tightly integrated. Of those surveyed, 75% responded that their solutions were tightly integrated, compared with 23% responding that their systems were loosely integrated and 2% responding with no integration.

From the survey result, one can overwhelmingly conclude that higher-education institutions prefer tightly integrated, vendor-supplied systems for their business needs.

Percentage of Modules Supplied by Vendors



IN-HOUSE OR OUTSOURCED

Some institutions choose to outsource business processes. The results of the LBCIO survey show that when it comes to administrative systems, very few institutions outsource their administrative applications. Fewer than 2% of those who responded to the survey indicated that they outsource core administrative systems. Only 2% outsource financial systems, 3.5% outsource advancement systems, and 4% outsource human resource systems.

We continue to see more institutions moving certain applications to the cloud. E-mail and learning-management systems seem to be the most popular. Will the future of administrative systems take these core business systems to the cloud as well? From our survey responses over the past three years, it appears that this movement of administrative applications to the cloud is slower than the hype about such movement. In 2012, only 6% indicated that they have either placed or are working on placing financial applications in the cloud.

One trend that we may begin to see more is that of shared services and partnerships when it comes to administrative systems. As institutions continue to seek to lower their costs, more institutions find themselves needing to consider shared services or collaboration. This year's survey indicated that 72% were looking at shared services and collaboration models as a way to save money.

UPGRADE PLANNING

Administrative systems take a considerable amount of money, time, and effort to implement and maintain. No university can really exist without them. Once these systems are in place, most institutions do not want to go through the process of changing them again for a considerable amount of time. So, what are institutions planning for replacements or major upgrades to their administrative systems?

Most institutions are currently implementing new systems, upgrading current systems, or planning replacements or major upgrades to their financial, student system, human resources, or advancement systems within the next six years.

Over the past 30 years of using IT to support the management of higher-education institutions, we have found that in any given year, about 10% to 15%

of institutions either are planning the replacement or upgrade phase or are actually changing systems. This year's data are similar. Almost 14% are currently replacing financial systems, 16% are replacing student systems, 15% are replacing human resources systems, and 9% are replacing advancement systems.

According to the 2012 survey responses, in two to three years 22% of responding institutions will replace their financial systems, 27% will replace their student systems, 25% will replace their human resource systems, and 29% will replace their advancement application. In the four- to six-year window, 22% will replace financial systems, 18% will replace student systems, 20% will

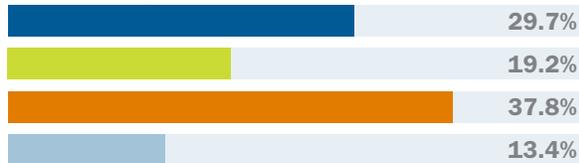
replace human resource systems, and 23% will replace advancement systems.

The survey also shows that the majority of respondents see fewer shadow systems at their institutions than they did a few years ago. In fact, 51% responded that shadow systems were discouraged, and only 27% indicated that their institutions use them.

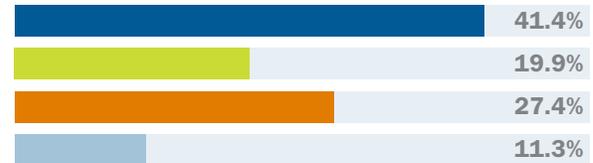
In summary, ERP solutions are still the most commonly used solution. Although open-source solutions are often touted at conferences, only 6.5% of research universities report the use of open source for financial systems; no other type of institution reported the use of open-source solutions for their core applications. Most institutions

When Will Institutions Replace or Upgrade Current Systems?

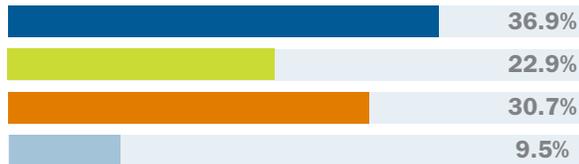
Grants Management



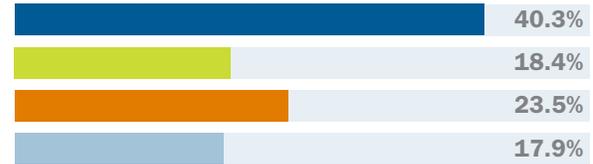
Financial Aid



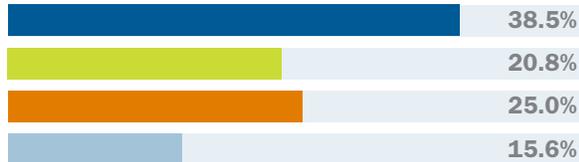
Advancement



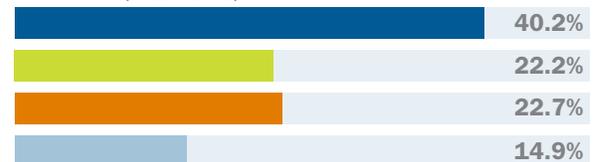
Student Registration, grading, transcripting



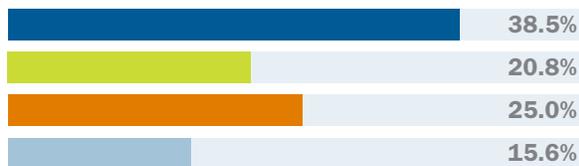
Payroll



Financials(GL, AP, AR)



Human Resources



prefer ERP vendor-provided systems that are tightly integrated and under the control of their institution as opposed to outsourced solutions. The majority of institutions will be planning for and/or implementing new systems in the next six years. This is to be expected as a follow-up wave to the pre-Y2K surge that caused many institutions to acquire new systems from 1995 to 2000. Partnering with other institutions through shared services or collaboration agreements may provide some institutions with a cost-saving strategy. Although many institutions are interested in pursuing such strategies, few are actually doing so at this time. We also see a need to invest in mobile applications that are tied directly to administrative system data, such as student schedules, bill payments, and course grades. For students, these tools have already become a necessity as the mobile world continues to grow.

ACADEMIC COMPUTING

This survey confirmed a number of trends dealing with teaching and learning, including the following:

- Vendor dominance in the learning management or course-management system (CMS) market is being challenged by open-source applications such as Moodle and Sakai.
- Central IT continued to provide the primary support for the CMS, though the number of respondents using shared services has increased.
- The Office of the CIO or the Office of the Provost/Chief Academic Officer remained the primary source for instructional design, course design, and online-learning management (69%).
- Most respondents continued to outsource student e-mail services (75%).
- Institutions have strongly adopted desktop virtualization with a concomitant curtailment of the growth of student community labs; 25% of respondents use desktop virtualization to replace student community labs.

A majority of institutions (59%) use a vendor-supplied CMS as the standard, while 30% use open-source solutions, 8% have an outsourced solution, and just 2% utilize a home-grown solution. Blackboard remains the dominant CMS vendor, with 45% of respondents using

it as the institutional standard. Moodle was reported as the standard by 26%, and Desire2Learn was third with 12%. Sakai and Angel (now owned by Blackboard) were reported as standards by 7% and 4% of respondents, respectively, and Instructure's Canvas product was used by a few institutions (3%). However, the use of open-source solutions has been increasing since 2010 at the expense of vendor solutions.

(Please note that our data are not intended to be used as marketing data for the use of CMS in higher education. Our sample size is global and large, but it is only meant to provide useful trend information and strategic and tactical support for CIOs in higher education.)

CMS CURRENTLY USED AS THE INSTITUTIONAL STANDARD

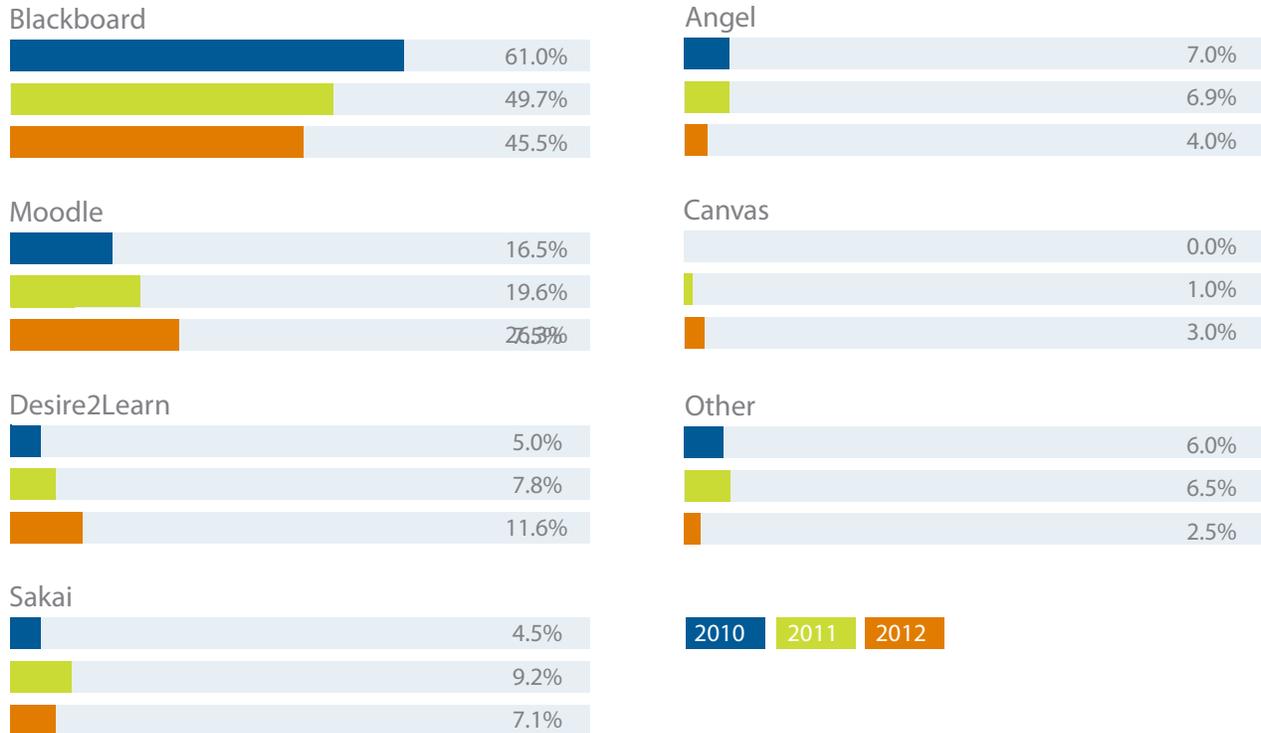
Just over half of the respondents (54%) have used their current CMS for longer than five years. Six percent of respondents are in the process of implementing their CMS, with the remainder (40%) having had their CMS for less than five years.

The CMS market space is likely to be dynamic over the next several years, with approximately a third of the respondents falling into one of three categories: changing now or in two to three years; committing to their CMS for three years or more; or uncertain when they would consider a replacement. Only 37% of respondents planned to stay with their current CMS for more than 3 years (37%), 30% were not sure when they would replace their CMS, 19% were currently changing their CMS, and 17% were considering a switch in two to three years.

A majority of respondents (63%) assign responsibility for the CMS and related infrastructure maintenance to the central IT unit, whereas 16% of the institutions outsource maintenance and 10% had a separate unit for online education maintaining the CMS. Finally, a small number of institutions had an academic computing group maintaining the CMS.

Shared services appear to be gaining in the role of supporting a CMS. Of the respondents, 32% were considering establishing a service center and 16% have already implemented shared services to support a CMS. A similar number of institutions (46%) were not considering shared services. Seven percent were not sure.

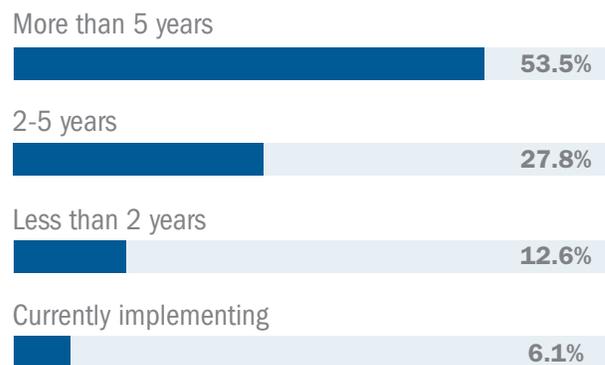
Course Management Systems Reported for 2010 - 2012



Reporting instructions varied for instructional design, course design, and management of online learning. In two-thirds of the cases, these functions report to the CIO (35%) or the provost or chief academic officer (33%). In 17% of respondents, these functions report to a separate unit for online education, and in 10% of the cases, they report to a dean-level executive.

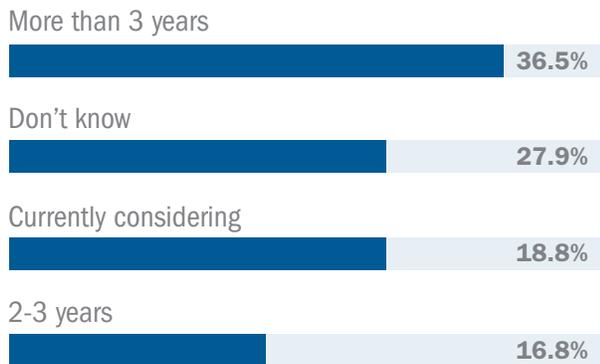
Concerning outsourcing and e-mail, institutions are more likely to outsource student e-mail than faculty and staff e-mail. Student e-mail is outsourced by 76% of respondents. Google is the choice for student e-mail (reported by 39%), while Microsoft was reported as the standard by 34%. A majority of institutions do not outsource e-mail for faculty and staff (68%). However, when institutions do outsource this service, Google was reported as the standard by 19% and Microsoft was next with 10%. Smaller institutions (up to 10,000 students) were much more likely to outsource to Google than were

How long have you used your CMS?

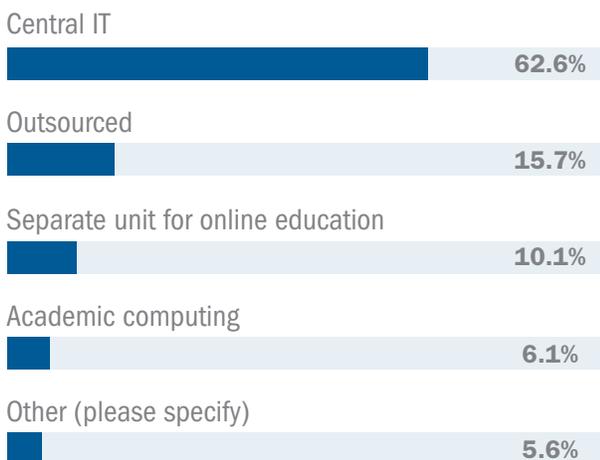


large institutions (more than 10,000 students). Among smaller institutions, 24% outsourced to Google and 7%

When will you consider replacing your CMS?



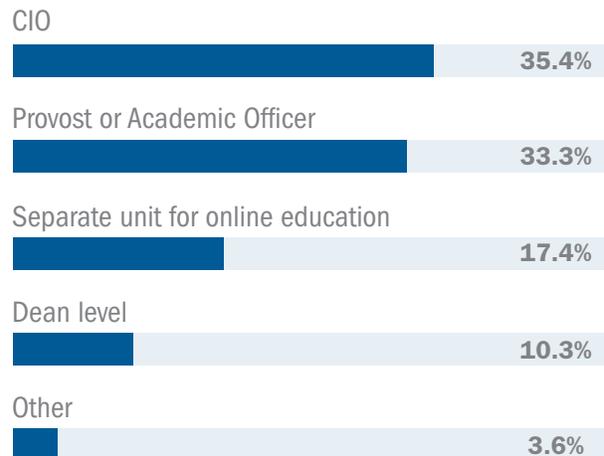
Who is responsible for maintaining your CMS and related infrastructure?



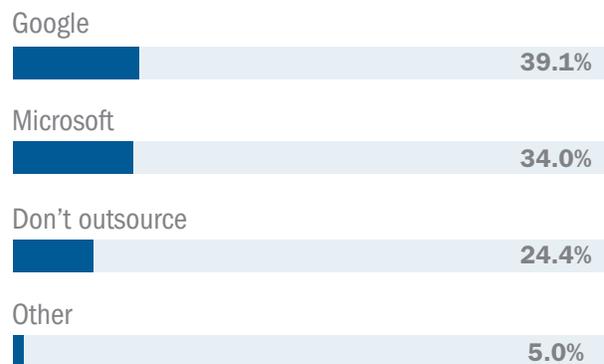
to Microsoft. Larger institutions outsourced to Google 9% of the time and to Microsoft 11% of the time. Overall, smaller institutions were more likely than were larger institutions to outsource faculty and staff e-mail.

CIOs are reporting an increased adoption of desktop virtualization (VDI) solutions. Just over 38% of the institutions have deployed a VDI solution, compared with 32% in 2011, and 37% were in the planning stages of a VDI implementation, compared with 37.3% in 2011. Only

Where does instructional design, course design, and the management for online learning report?

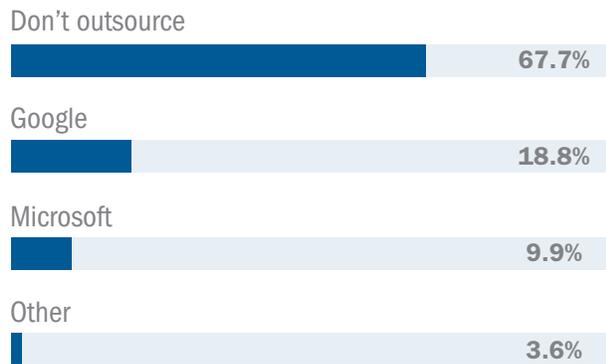


Do you outsource e-mail for students, and if so, to whom?

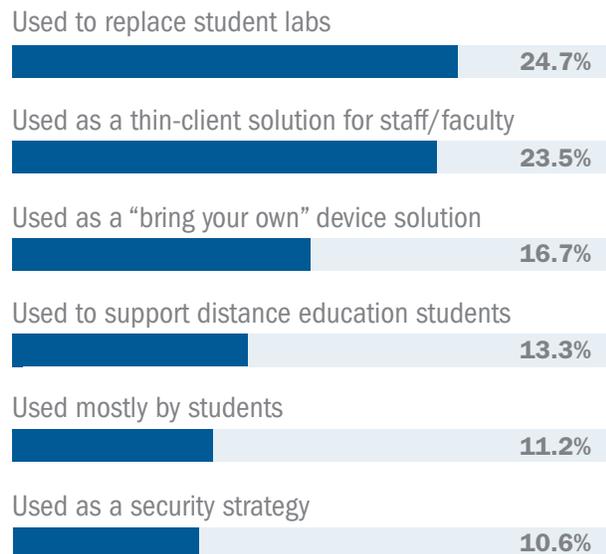


24% of the institutions reported that they had neither planned nor deployed a VDI solution, down from 30.7% in 2011. Adoption is robust despite some differences based on institutional size. In small institutions with 3,000 or fewer students, 64% said they have or plan to implement VDI, compared with 85% of the very large institutions (25,000 or more students). The majority (71%) of respondents were considering or already using VDI as a solution for students. Only 29% were not

Do you outsource e-mail for faculty and staff and if so, to whom?



Which best describes your plans for desktop virtualization?



considering or using VDI as a solution for students. For both students and faculty/staff uses, institutions cited replacing student labs (25%) and using it as a thin client for faculty and staff (24%) as the top two reasons for VDI. In terms of the goal for VDI, approximately 17% of

the respondents indicated support for BYOD strategies, and 13% of the reasons cited were to support distance education for students. About 10% of respondents cited security as the goal for VDI. VMWare is the VDI tool deployed by 49% of the respondents, while Citrix was listed by 29%, Microsoft by 9%, Xen by 3%, and a variety of others by 11%.

With the broad adoption for VDI, it is helpful to look at what our respondents said about the future of desktop installations and community labs. As expected, these two areas are seeing slower growth. Just 50% of the institutions expect desktop installations to stay about the same or decrease. Forty-seven percent expect desktop installations to grow. Community labs are much more likely to shrink in the coming years. Only 15% of the institutions expect community labs to grow, with 85% seeing a decrease or no growth. A sizeable number of institutions (37%) expect student use of WiFi and local area network ports to augment the use of community labs, thus curtailing any growth.

Institutions would like to decrease the number of community labs being supported, but about as many are increasing their number of community labs (15.2%) as are decreasing their number of supported labs (17.4). However, VDI and BYOD may have a greater effect on those numbers in the future.

INFRASTRUCTURE AND NETWORKING

INFRASTRUCTURE IN THE PERFECT STORM

Buzzwords and topics like "cloud storage," "BYOD," and "security breach" have caught the attention of CIOs in the industry. Do these concepts have any particular implications for infrastructure and networking on university campuses? The LBCIO survey focused on three primary areas that might be affected by current technology trends:

- Security
- Disaster recovery and business continuity
- Networking infrastructure

This section of the survey was relatively brief, but the results do provide some insights on how higher education institutions are responding to the rapidly changing technology landscape.

SECURITY

Computer and network security breaches have garnered significant attention in the popular press. CNN Money, for example, highlighted nine of the worst security breaches ever in June 2012 (<http://money.cnn.com/galleries/2012/technology/1206/gallery.9-worst-security-breaches.fortune/index.html>).

Organizations that suffered breaches ranged from professional social-networking sites to dating sites, to ecommerce sites. One of the compromised environments belonged to a firm that provides two-factor secure authentication. If major corporations are suffering these kinds of breaches, what must institutions of higher education do to protect themselves, and how are they planning for the future?

Effective leadership is required to implement an appropriate security plan. More than half (56%) of the institutions surveyed indicated that they had a specific person designated as chief security officer (CSO). This percentage has not changed significantly in the past three years. More than 90% of the CSOs report through the IT organization, so it would be reasonable to assume that (for those organizations without a designated CSO) the security function is a component of one or more IT positions.

Security plans often include protection strategies, educational efforts, and measurement techniques. Our survey results show that 50% of institutions have a formal security plan and another 21% are in the process of developing such a plan. The security plans are formulated against a backdrop of a security audit: identifying security resources that are already in place. More than three-fourths of the institutions have completed at least one security audit. One interesting change in the survey data is that the number of institutions that conduct a security audit at least annually dropped from 44% in 2011 to 37% in 2012. Although auditing activity decreased, security spending increased in 72% of the institutions. Only 2% reported a decrease in security spending.

DISASTER RECOVERY AND BUSINESS CONTINUITY

In a real sense, security planning is an exercise in providing insurance against undesirable outcomes. Disaster recovery and business continuity reflect that same philosophical basis: determining an appropriate amount of effort and expense to be applied against risks that are somewhat difficult to quantify. Recent natural disasters such as hurricanes Katrina and Ike have prompted IT professionals to consider the impact of severe disruptions in computing and networking.

The percentage of institutions with a formal business continuity plan (77%) is higher than the percentage that have a formal security plan (50%). This difference might be due to the relative familiarity with the risks (we all know what it is like to encounter bad weather or a fire), or it could be that higher-education institutions have a longer history of protecting physical assets than they have with protecting electronic assets.

One of the ironies of planning within higher education is the tendency to avoid rehearsing the plan. More than one-third of the respondents indicated that their business continuity plan had never been tested.

A participant at a recent conference observed that IT professionals spend a lot of time planning for the “100-year flood” when they should be more concerned about the routine thunderstorm. Those who don’t have any plan may believe that plans for the extreme disaster are so daunting that IT professionals cannot muster the energy to build the plan and test it. Others are convinced that a modest plan that is tested might be more effective than an untested elaborate plan. In practice, it may be that institutions are taking this latter approach: 56% have a secondary data center that provides some level of recovery potential in the event of a catastrophe affecting the primary data center.

NETWORKING

While coping with security concerns and potential disasters, institutions still need to provide a robust network for their constituents. Increasingly, this means ubiquitous wireless access and high-speed wired access.

Over the past three years, 69% to 79% of the survey respondents have indicated that wireless access is “available on all campuses to everybody.” The most recent figure was 69%. The drop may be reflective of

respondents hesitating on the “all” and “everybody” words, as some students do when answering true-false questions.

Wired networking remains an important service on many campuses: 42% of the respondents provide some level of gigabit service to the desktop. Of those respondents, 35% and 19% indicated that gigabit service was provided to all faculty/staff and students, respectively. Why would wired connectivity remain important in a wireless world? LBCIO board members have offered two reasons from their own institutions: Faculty researchers often need to transfer large data sets that would be cumbersome on a wireless network. For students, life in the residence halls includes the use of video game consoles that function best (or perhaps only) in a wired environment. The proliferation of wireless devices can saturate a particular spectrum to the point where a wired connection is preferred for some activities.

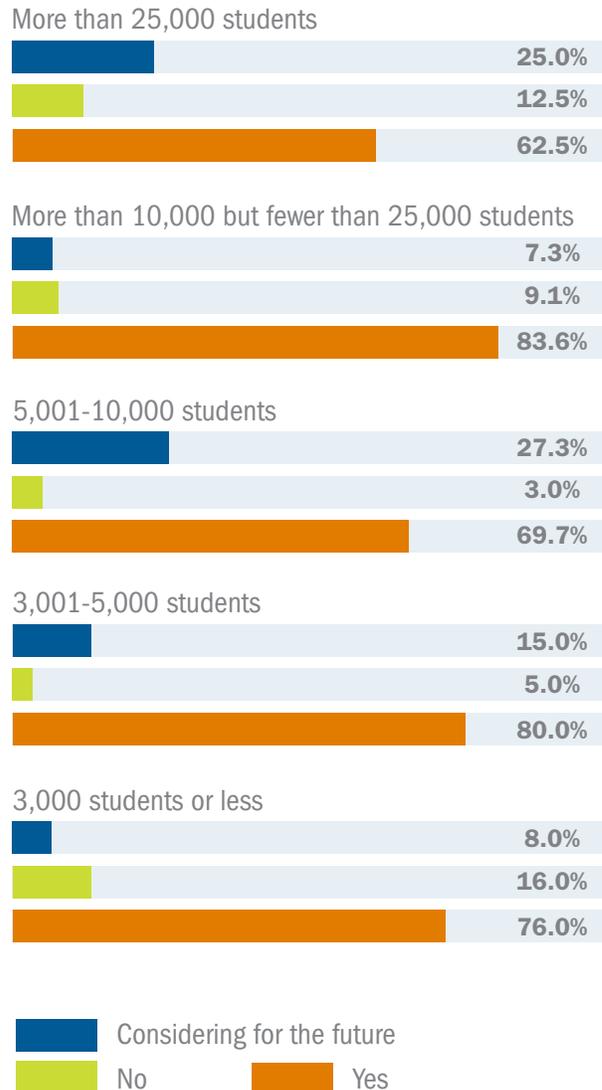
CLOUD COMPUTING AND NEW AND EMERGING TECHNOLOGIES

Most institutions reported using cloud computing, with no significant difference in usage percentages reported by Carnegie classification. The majority of doctoral-granting institutions are either currently using or considering using the cloud in the future (96.8%), while only 88.4% of research institutions reported using or considering usage. There is no significant difference in usage between public and private nonprofit institutions (73.2% and 76.7%, respectively). Furthermore, larger institutions (more than 25,000 students) reported a lower usage rate (62.5%), but 25% of those large institutions are considering using cloud computing in the future.

CLOUD COMPUTING ACTIVITIES

Higher-education institutions that are using cloud computing reported different types of activities. Most institutions reported using cloud computing for a mix of academic, administrative, and community services. If you are using cloud computing, which best describes the cloud-computing activities?

Use of cloud computing by size of institution:



CLOUD COMPUTING INFLUENCING FACTORS

Institutions reported many factors influencing their usage of cloud computing. Most reported saving money as the top influencer. Many institutions, especially two-year institutions, reported the ability to bring new activities online quickly as the factor with lowest influence

over using cloud computing. Most public and private institutions were more interested in saving money. Security, privacy concerns, ownership protection, and access to data are also very important to most CIOs.

CLOUD COMPUTING IMPACT ON BUDGET

Most institutions reported expectations for a moderately positive impact on the budget when using cloud computing; however, 68% of research institutions expect moderately positive to very positive results utilizing cloud computing. Interestingly, doctoral-granting institutions expect higher negative impact than others (11.1%), even though the majority of doctoral-granting institutions expect positive or very positive impact (46% and 9.5%, respectively). Two-year institutions expect some negative impact (somewhat negative, 9.5%; and very negative, 4.8%) and the lowest overall moderately or very positive

Cloud-computing Activities

Not sure



Mix of academic and administrative and community



Community service or outreach



Mostly management needs (administrative information)



Mostly academic (teaching and learning)



impact (only 47.7% total).

APPLICATIONS IN THE CLOUD

Most institutions are cautiously moving ahead in implementing cloud applications on campus. Mail is the primary application that all institutions, regardless of size, type, and classification, have moved to the cloud. This is not surprising because vendors have

supplied and created e-mail applications for the general population, which increased both interest and personal use of e-mail. Vendors have also assisted in moving the on-campus service to the cloud at no cost to the institution, which eased many IT budgets. The second leading application reported in the cloud is social networking; again, the application existed in the cloud, and the user community encouraged the adoption of the application as a campus service. It is noteworthy that most CIOs do not consider campus enterprise applications (e.g., ERP, CMS, library systems) as good candidates to move to the cloud.

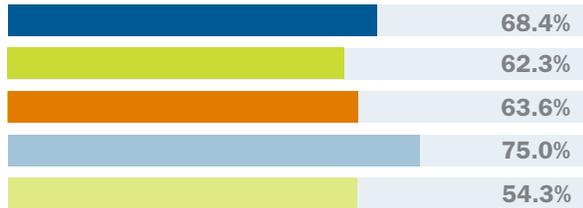
Applications Currently in the Cloud	
Other (please specify)	23.5%
Student applications (enrollment management)	19.6%
Financial applications	6.1%
Library applications	27.9%
Desktop tools (i.e. MS Office)	26.3%
Data center	12.3%
Portal	13.4%
Social Networking	43.6%
E-Mail	83.2%

APPLICATIONS EXPECTED TO MOVE TO THE CLOUD

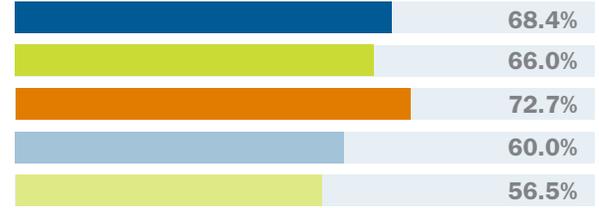
All institutions are planning to move similar applications to the cloud. The primary growth will be experienced in moving mail/social applications and learning-management systems to the cloud. More than 80% of two-year institutions are planning to move the learning-management system to the cloud, compared with 50% of all other institutions. Many new learning-management systems are offered only as a cloud application, which encourages institutions to consider the migration. One interesting service being considered for cloud adoption is storage, with more than 50% of all institutions considering storage in the cloud.

Cloud Computing Influencers by Size

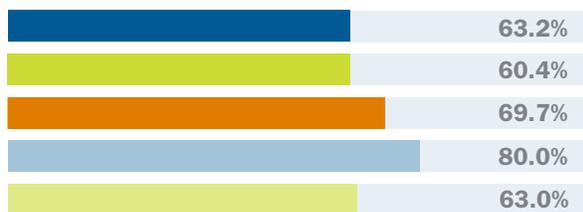
Ability to bring new activities on-line quickly



Concern about privacy



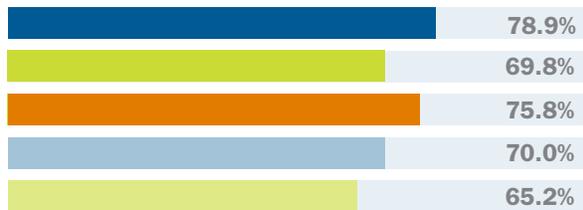
Access to data/information in the cloud



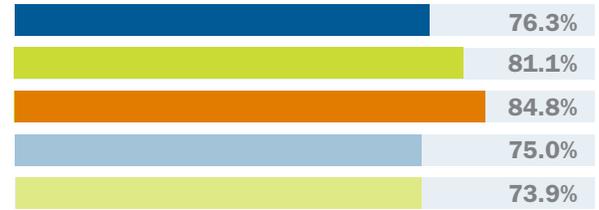
Concern about security



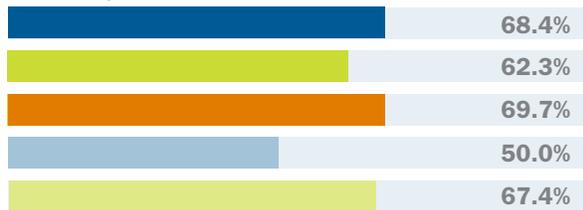
Protection of sensitive data/information



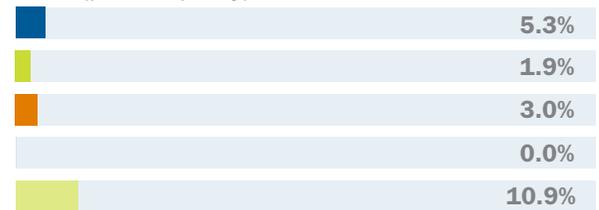
Saving money through the use of cloud computing



Ownership of data



Other (please specify)



■ More than 25,000 students
■ More than 10,000 students but fewer than 25,000 students

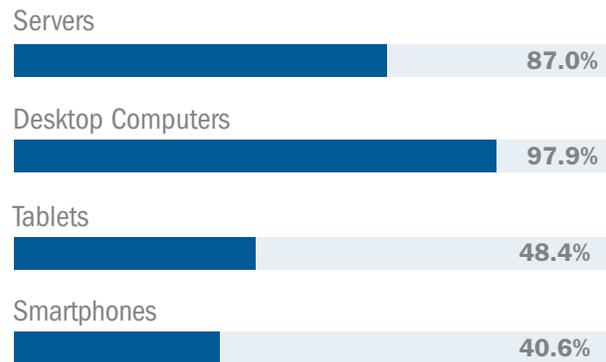
■ 5,001-10,000 students
■ 3,001-5,000 students
■ 3,000 students or less

Which of the following areas are you either currently placing in the cloud or are in the process of placing in the cloud?	
Administrative applications (ERP)	38.9%
Academic applications including course management systems/ learning management systems	60.0%
Web development/applications	37.3%
E-mail/social networking/ communications	75.7%
Portal	27.0%
Primary data center	6.5%
Back up data center	49.2%
Storage/Networking	69.2%

STANDARDS-SETTING

University technology communities have changing standards. All institutions of any size or type have standards for notebooks, desktop computers, and servers. Nonprofit institutions led with 100% having standards in all three categories, followed closely by public universities (85%) and private colleges (95%). Standards adoption is not common with smartphones and tablet computers in public (48%) or private universities (43%), but was significantly more common at two-year institutions (70%). As personal ownership continues to control the mobile-device market, universities will have a difficult time enforcing standards. A more likely scenario is that the market will determine the standard that universities will be required to support, as seen in the survey responses for smartphones and tablets.

Central IT Provides selection criterion and/or standards for...



WHAT ARE CIOs DEFINING AS EMERGING TECHNOLOGIES?

There are no surprises in the emerging technologies that CIOs are planning to explore and/or implement on campus. The two technologies that universities are most interested in are BYOD services and virtual desktops. BYOD interest is a result of students, faculty, and staff purchasing their own mobile devices and requiring IT departments to provide access to university enterprise resources. Virtual desktops are gaining interest as personal ownership of computers increases and it becomes impractical to offer university computing labs to provide access to specialized software. Virtual desktops complement the BYOD movement. Other areas of interest in emerging technologies are cloud computing, data management, networking, and teaching tools.

List of the top 3 new and emerging technologies CIO's are considering	
Mobile Devices/BYOD	23.1%
Virtual Desktops	17.7%
Cloud	15.8%

SUMMARY AND METHODOLOGY

Although budgets are still tight and many institutions are in cutback mode, CIOs continue to plan for changes in IT to ensure that the institutions' information needs are securely met. Some positive results indicate the following:

1. VDI shows great promise in providing expanded services while cutting back on institutionally owned labs.
2. The use of shared services is expanding and will be worth watching in the future.
3. IT governance is not a passing fad, and more institutions rely upon their governance model when making major IT decisions.
4. The use of cloud and open-source computing continues to grow on campus, but growth is slower in the administrative applications area.
5. The need for more bandwidth continues, and gigabit-to-the-desktop service is no longer just for the large research institutions.

The 2012 survey was sent to almost 1,100 CIOs globally, and the response rate was more than 20%. The survey was conducted the last week of April 2012 and completed the second week of May 2012. More than

63% of respondents were from public institutions, while 36% were from private institutions and less than 1% were from proprietary institutions. Research universities comprised 25.2% of respondents, four year institutions with master's degree programs 32.6%, doctoral-granting institutions 15.1%, two-year institutions 10.1%, and four-year institutions with no graduate programs 17%. The proportion of respondents by institution size, based on full-time enrollment, is as follows:

Fewer than 3,000 students	24.8%
3,000 to 4,999 students	10.1%
5,000 to 9,999 students	17.4%
10,000 to 24,999 students	28%
More than 25,000 students	19.7%

If you would like more information about the survey or The Leadership Board for CIOs in Higher Education, or would like to become a member of LBCIO, please contact—

Dr. Michael Zastrocky, Executive Director
1271 Cedar Street Broomfield, CO 80020
+1 720 242 5150
Mobile +1 303 807 9408
mzastrocky@lbcio.org

Or visit the LBCIO Web site at: www.lbcio.org

CURRENT MEMBERS OF THE LEADERSHIP BOARD FOR CIOS IN HIGHER EDUCATION**Brian Cohen**

Associate Vice Chancellor for Technology and University CIO
City University of New York

Reid Christenberry

Assistant Vice President and CIO
Georgia Perimeter College

Leonard De Botton

Vice President of Information Systems/CIO
Berkeley College

Jerome DeSanto

Vice President for Planning and CIO
University of Scranton

Elias G. Eldayrie

Vice President and Chief Information Officer
University of Florida

Tim Ferguson

CIO
Northern Kentucky University

Jan I. Fox

Senior Vice President for Information Technology/CIO
Marshall University

Peter Greco

CIO
Saint Mary's College

Naveed Husain

CIO
Queens College, CUNY

Vince Kellen

CIO
University of Kentucky

Mark Legg

CIO Emeritus
Flinders University (Australia)

David E. Lewis

Vice Provost and Chief Information Officer
University of Rochester

James Lyall

CIO/Associate Vice President
Metropolitan State University of Denver

Kathy Monday

Vice President for Information Services and CIO
University of Richmond

Allan Morris

CIO
Southern Cross University (Australia)

John Mullin

CIO Emeritus
The Georgia Institute of Technology

Lígia Maria Ribeiro

Pró-Reitora para a Universidade Digital (CIO)
Universidade do Porto (Portugal)

David Rotman

CIO and Associate Vice President
Cedarville University

Tina Stuchell

Director of IT
University of Mount Union

M. Lewis Temares

VP/CIO, Dean of Engineering, Emeritus
University of Miami

Rodney Tosten

Vice President for Information Technology
Gettysburg College

Nelson Vincent

Chief Information Officer
University of Cincinnati

The Enterprise Cloud for HR and Finance



Built from the cloud up, Workday offers the most intuitive user experience for an enterprise application. **Ever.**



Leadership Board for CIO's

Dr. Michael Zastrocky, Executive Director
1271 Cedar Street Broomfield, CO 80020
+1 720 242 5150
Mobile +1 303 807 9408
mzastrocky@lbcio.org

Sponsored by:



Workday provides the only unified, global Human Capital Management, Payroll, and Financial Management solution delivered in the cloud and uniquely designed for the needs of higher education.