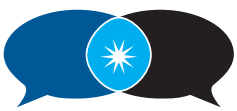
Information Technology in Higher Education:

2010 Survey of Chief Information Officers



THE CHRONICLE
Leadership Board for CIO's

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INTRODUCTION

Higher-education institutions have come to rely upon technology to provide solutions and the infrastructure to support increased demands for services while dealing with a shrinking, less-experienced work force and tight budgets. It's left up to chief information officers to find ways to support new technologies.

Making decisions about which technologies to acquire today and which to adopt in the future can have a significant impact on budgets and strategies, and it requires wise choices, with little room for error.

To get a full picture of information technology on campuses today, The Chronicle of Higher Education's Leadership Board for CIO's surveyed a broad range of colleges and universities in early 2010 to collect strategic and tactical information on major issues that face chief information officers in higher education around the world.

Survey questions included financial and budget information for IT, personnel and staffing questions, infrastructure and networking questions (including security issues), administrative computing plans, strategic planning for IT, academic uses of information technologies, and plans for new and emerging technology.

More institutions are expecting technology budgets to increase faster than inflation during the next five years, rather than to decrease, according to the survey. Many of the CIO's expect technology to take on the role of bringing about cost savings and greater efficiencies in other areas, such as library checkout.

But how should institutions plan for the next five years? Which technologies and applications are worth the investment? At the top of the list are mobile computing, followed closely by networking and security, cloud computing, business intelligence, and virtual-desktop technologies. All of these are not really new, but on most campuses they are the technologies that must be dealt with in the next few years.

Mobile computing includes supporting consumer-owned devices and making sure that they connect seamlessly with the campus network from anywhere in the world. Many institutions are hampered by the fact that consumers often own these technologies and expect support before support-staff members on campus have even touched the new devices.

Cloud computing is a new spin on hosted computing, a topic that has been around for some time. Cloud computing is loosely defined as a shared pool of configurable networks, servers, storage, applications, and services accessed through the Internet. Many institutions have either moved or are seriously considering moving e-mail, desktop solutions like Microsoft Office, and even some administrative applications "into the cloud," in which institutions set up services that operate on faraway servers rather than on individual campus computers. Many expect cost savings from moving some applications into the cloud. However, security vulnerabilities are still a worry for many institutions, and legal issues and regulations may interfere with such movements. For example, some countries will not allow institutional data to reside on servers in another country.

Network demand continues to increase as social-networking tools like Facebook and MySpace, and collaboration tools like Socialtext and Twitter, embrace all forms of information, including voice, video, and data. Network users expect to send video clips on demand, and instructors are using social-networking sites, collaboration resources, and content-management and learning systems to provide lectures online for students.

Providing bandwidth and protecting that information will not get any easier as the use of technology increases off-campus and sensitive information resides on servers in different places. Ownership of lectures is an issue on many campuses as well: Does the institution or the instructor "own" the online lecture? Should it be free to the public?

In addition, business-intelligence solutions continue to be needed as campuswide databases and integrated solutions often fail to provide information or knowledge that can be used to gain wisdom and understanding. However, business-intelligence tools require considerable training on the part of users and support-team specialists. Higher-education institutions do not often provide adequate time and resources for user training on such technologies and applications. Technologies and applications are helpful only if users know how to employ them.

CIO's who are skilled at building teams of knowledge workers across campuses to work on solving institutional problems and meeting needs will be viewed as true business partners to both administrative and academic departments. They will be invited and expected at the strategic-planning table. CIO's who fail to market and educate institutional leaders and users and students on the real value and role of technology will end up as mere caretakers of infrastructure and be excluded from strategic or highly tactical planning.

— Michael Zastrocky

FINANCIAL AND BUDGET PLANNING

The chief information officers who responded to the survey reported on the state of the operating budgets for their institutions overall and for information technology in particular. They provided comparisons of the actual figures for the current fiscal year (2009-10) in juxtaposition with the previous year, as well as their expectations for 2010-11 budgets.

OVERALL INSTITUTIONAL BUDGETS

The results were mixed for the colleges and universities as a whole. Many of the institutions saw decreases, but a healthy percentage saw increases:

- Forty-three percent of the institutions reported they had lower overall operating budgets in 2009-10 compared with the previous year. And 43 percent expect further decreases for the 2010-11 year.
- Almost one-third of the institutions (32 percent) reported increases in the overall institutional budgets in 2009-10, and 31 percent expect larger overall budgets in 2010-11.
- The remaining institutions (26 percent) said the overall budgets for their institutions stayed the same in 2009-10 as the prior year, and the same percentage expected the budgets for 2010-11 would be flat.

BUDGETS FOR INFORMATION TECHNOLOGY

For IT spending in particular, the patterns for the 2009-10 budgets and expectations for 2010-11 were similar to the overall institutional patterns.

For 2009-10, in comparison to the previous year, 43 percent of the colleges and universities experienced decreases (matching the experience with overall budgets). Twenty-four percent of the budgets showed increases, and 33 percent were flat.

A similar picture emerged in expectations for spending in 2010-11:

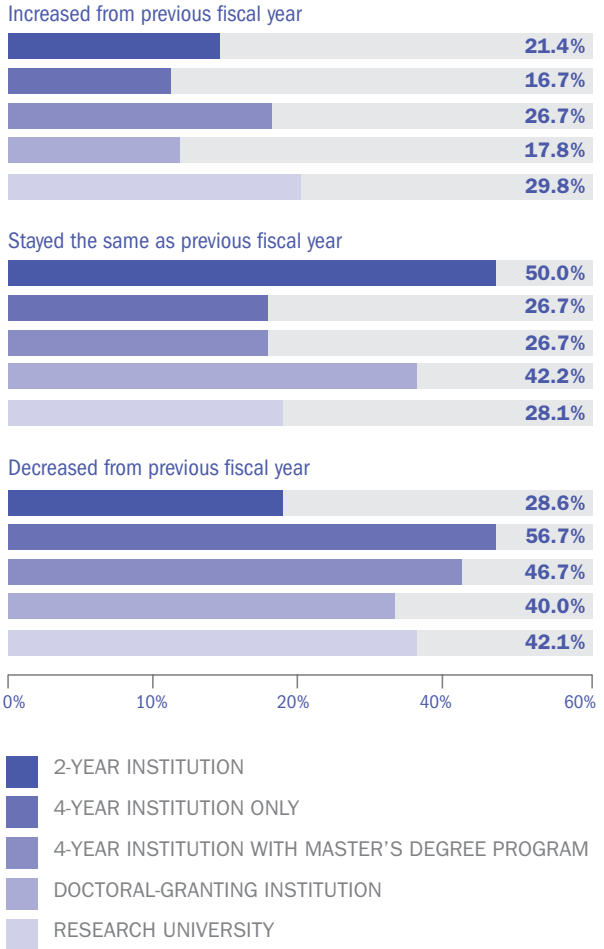
40% of the institutions expected a decrease from the current year.

32% of the institutions expected spending to stay the same.

28% of the institutions said they expected increases.

Some widely differing budget patterns for 2009-10 for IT were evident by type of institution.

Has your current fiscal year operating budget (2009/2010) for IT:



- Of four-year colleges without graduate programs, 57 percent reported decreases in their IT budgets in 2009-10.
- At two-year colleges, the proportion experiencing cuts was just 29 percent.
- At four-year institutions with Master's programs, 47 percent reported cuts, as did 40 percent of doctoral-granting institutions and 43 percent of research universities.

One-year increases for 2009-10 were reported by 30 percent of research universities, 27 percent of four-year institutions with Master's programs, 21 percent of two-year colleges, 18 percent of doctoral-granting institutions, and just 17 percent of four-year colleges without graduate programs.

For those colleges and universities that reported cuts in the IT budget from the previous year, the cuts came in the following areas:

- Delayed maintenance or replacements: 80 percent
- Personnel: 61 percent
- Services: 53 percent
- Software licenses: 27 percent
- Other: 18 percent

The "other" category responses included cuts in expenses related to travel and professional development (including association memberships), capital expenditures, renegotiated contracts, use of consultants, and Internet connections.

Respondents who said they were planning for no growth or a decrease in their IT operating budgets said they would be likely to follow these strategies:

- Renegotiating contracts with vendors: 62 percent
- Cutbacks in services and support: 57 percent
- Non-replacement of staff leaving the institution: 49 percent
- Elimination of staff positions: 25 percent
- Increased use of chargebacks for services and support: 20 percent
- Increased student fees: 18 percent
- Other: 18 percent

The "other" strategies included these:

- Alternative sources for services (cloud apps, consortium, etc.)
- Budget reallocation and business-process improvements
- Extension of computer replacement cycle
- Postpone strategic projects
- Increase technology replacement cycles, where appropriate and possible
- Explore opportunities to restructure workflows
- Explore increased consortia opportunities
- Restructuring current positions
- Cut back on upgrades
- Cutting back student positions
- Reduced professional development for IT staff

Institutions were also asked whether they were considering new funding sources:

46% of the institutions said they were not.

35% said they were considering increased user fees for faculty, staff, students, and others.

23% said they were considering selling IT and support services to others.

15% specified "other," in many cases saying that they would seek grants.

ORGANIZATIONAL ISSUES AND PERSONNEL

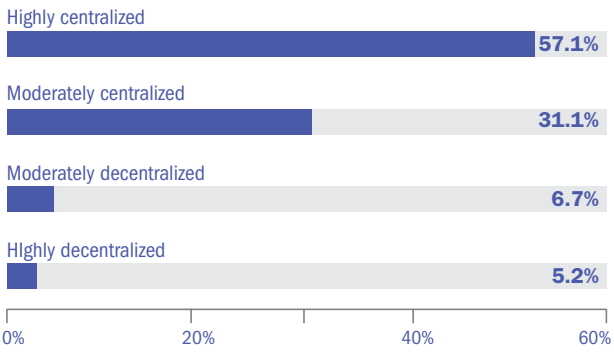
IT LEADERSHIP AND ORGANIZATION

Institutions were asked to whom the CIO reports.

Overall, 31 percent reported directly to the CEO (president, rector, or vice-chancellor), 28 percent to the chief academic officer, 20 percent to the chief operating officer (executive vice president or administrative vice president), 19 percent to the chief financial/business officer, and 2 percent to a person two levels or more below the CEO.

Information technology operations are organized in several different ways on campuses, but the great majority are either highly or moderately centralized:

Is IT:



However, significant differences emerge when IT organization by type of institution is analyzed, with much less centralization at doctoral-granting and research universities.

Just 22 percent of the research universities and 40 percent of the doctoral-granting reported highly centralized IT operations.

By contrast, 85 percent of the baccalaureate-only colleges said they had highly centralized operations, followed by 78 percent of the four-year institutions offering Master's degrees and 71 percent of two-year colleges.

Another way of looking at the centralization of IT operations is to examine institutional budgets. Central IT drew 90 percent or more of the total institutional spending on information technology at 37 percent of the institutions, the largest proportion of respondents.

The proportions going to central IT at three other levels, though, were evenly distributed:

- At 20 percent of the institutions, 75 to 89 percent of total IT spending went to central operations.
- At 22 percent of the institutions, 50 to 75 percent of total IT spending went to central operations.
- At 21 percent of the institutions, less than 50 percent of IT total spending went to central operations.

Looking to the future, a majority of institutions (55 percent) said they expect IT centralization will stay the same in the next five years. But 39 percent said they expect operations will become more centralized. Only 6 percent expect less centralization.

The universities that are highly decentralized now are the ones that most expect to see more centralization in the next five years, with 61 percent of the research universities and 55 percent of the doctoral-granting universities expecting that outcome.

Following the overall patterns, the other types of institutions showed a decreasing likelihood of increased centralization: 36 percent of two-year colleges, 26 percent of four year colleges with Master's degree programs, and 7 percent of four-year colleges with no graduate programs.

When asked who would make the decision about making IT more or less centralized, 90 percent of respondents said it would be the executive team (CEO's cabinet). Just 6 percent said that the decision would involve the board of trustees. Other groups that would be involved at a small number of institutions included academic leadership, IT departments themselves, and committees or "consensus."

IT STAFF SIZE AND COMPOSITION

More than half (56 percent) of the institutions said the size of their full-time IT staff had stayed the same in the current fiscal year. But for 28 percent the size decreased. For 16 percent, the number of staff members increased.

Expectations for the 2011 fiscal year showed optimism on some campuses: While 55 percent expected the size of the IT staff would stay the same, 25 percent expected an increase. The smallest proportion—20 percent—expected a decrease.

The institutions also reported on their use of student workers. For the 2010 fiscal year, use of students stayed the same at 61 percent of the colleges. The number increased at 27 percent and decreased at 12 percent. Expectations for use of students in fiscal 2011 showed almost precisely the same pattern.

TRAINING AND PROFESSIONAL DEVELOPMENT

Training programs for personnel are an important part of colleges' efforts when they need to get more out of fewer people due to downsizing. The survey found that expenditures for training and professional development decreased for the current fiscal year at 34 percent of institutions, while only 10 percent showed an increase. For the rest, expenditures stayed the same as in the previous year.

During the next two years, 25 percent of the institutions expect an increase in training expenditures, while 17 percent of the institutions expect a decrease.

However, 63 percent of the institutions that reported decreases in spending on training said the cuts had only minimally diminished the ability of IT to serve the institution. Only 4 percent said that the decreases had greatly diminished IT's ability to support the institution.

OUTSOURCING

Seventy-five percent of institutions said they are currently using outsourcing strategies, while 25 percent are not doing so.

In looking at the past two years, 52 percent said their use of outsourcing had stayed the same, while 45 percent said outsourcing had increased, and 3 percent said it had decreased. Looking ahead, 61 percent expect that their use of outsourcing in the next two years will increase, while 35 percent said the use would be likely to stay the same, and 4 percent expect it to decrease.

Although outsourcing is widespread, it does not command a large share of total IT spending, and indeed represented less than 5 percent of the total IT operating budget at 56 percent of the institutions. Of the remainder, 27 percent of the institutions said that outsourcing accounted for 5 to 9 percent of their IT budgets, and 12 percent said that outsourcing accounted for 10 to 19 percent of their budgets. Only a handful of institutions said that outsourcing accounted for 30 percent or more of their IT budgets.

Activities that the institutions are currently outsourcing to some degree include these (respondents could choose more than one):

- Networking/voice: 37 percent
- Administrative applications: 35 percent
- E-mail: 17 percent
- Project management: 14 percent
- PC lab maintenance and support: 7 percent
- Other activities: 28 percent

PERSONNEL ISSUES AND AN AGING WORKFORCE

A large number of IT professionals in higher education are aging and preparing for retirement. The survey asked how institutions expect that trend will affect them. A large majority of colleges and universities are not worried:

- 60 percent said the aging of the workforce would have "little impact."
- 17 percent said aging would have "no impact" at all.

However, almost one fourth (23 percent) expect the aging of the workforce to have "great impact" on their IT operations.

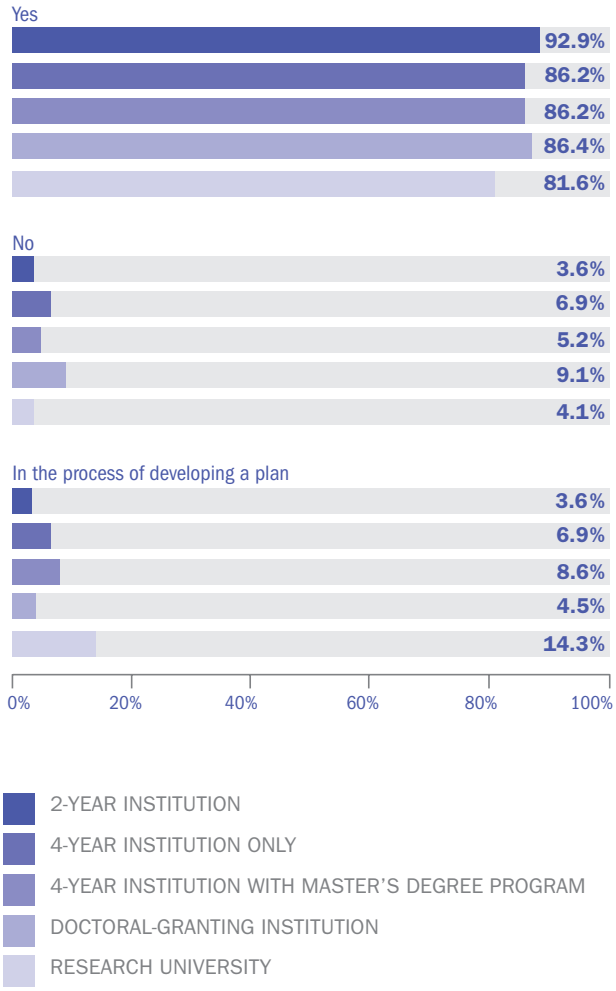
To deal with demographic changes in the workforce, institutions said they were either pursuing or considering these personnel strategies:

- Preparing for opportunities to transfer knowledge and experiences: 75 percent
- Brainstorming creative ways to recruit young faculty and staff members, with an understanding of generational characteristics: 54 percent

- Analyzing the demographics of the campus workforce and comparing it with local, regional, national, and global demographics: 32 percent
- Restructuring HR policies and practices: 27 percent
- Devising strategies to retain key people past retirement age: 21 percent

STRATEGIC PLANNING

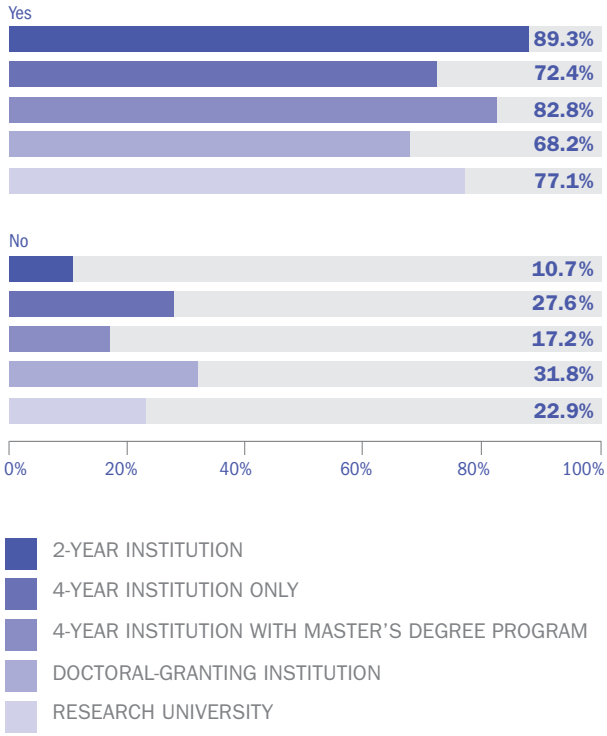
Does your institution have an overall strategic plan?



Eighty-six percent of the respondents said their institutions had an overall strategic plan. An additional 8 percent said they were in the process of developing a plan. Just 6 percent said they did not have an overall plan. Of the institutions that have a plan, 85 percent said that they update it regularly.

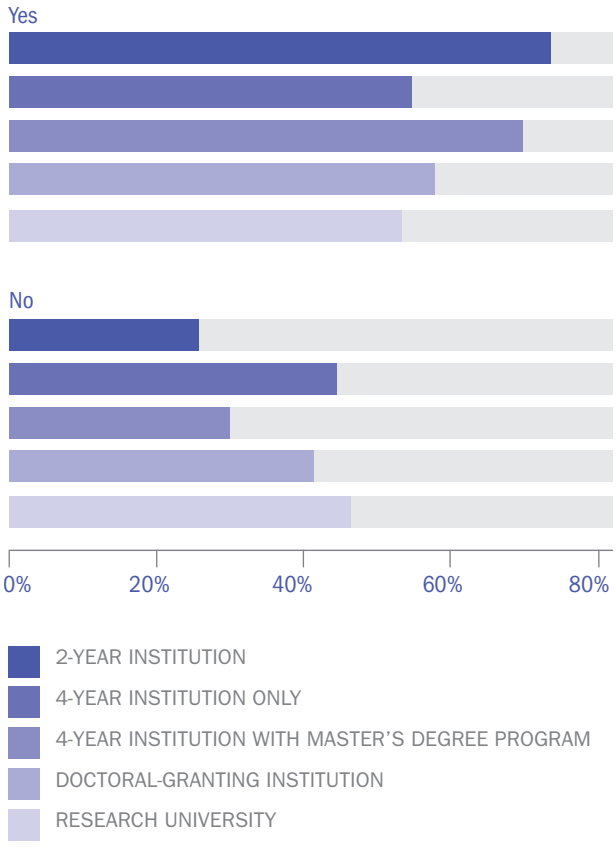
Almost as many institutions—78 percent—reported that they had a strategic plan for information technology. Of those, 62 percent said that the IT strategic plan was part of the overall institutional strategic plan.

Does your institution have an IT strategic plan?



Two thirds of the respondents said that the IT strategic plan was incorporated into the institutional budget-planning process.

Is your IT strategic plan part of your overall institutional strategic plan?



SERVICE-LEVEL AGREEMENTS

Service-level agreements, or SLA's, are agreements between two parties (for example, central IT and other departments or between a vendor and the institution) in which outcomes and expectations (time and service delivery expectations, for example) are spelled out in the agreement.

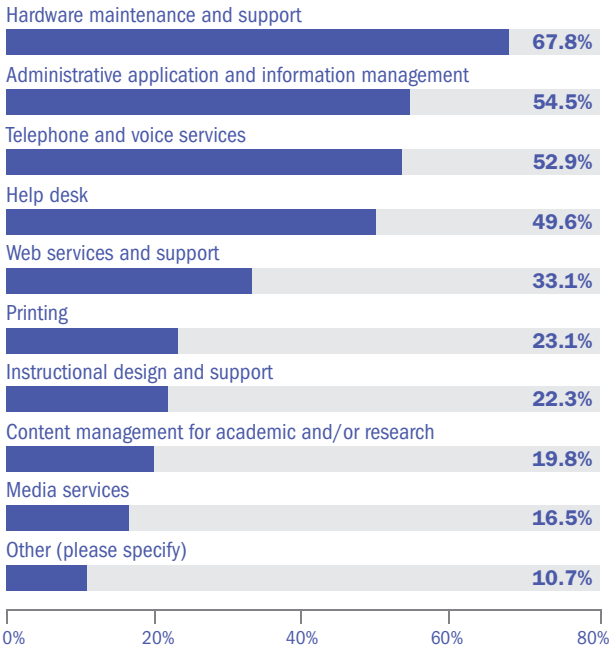
Most of the institutions in the survey (68 percent) had agreements for hardware maintenance and support for PC's and servers. That was the top category for such agreements, followed by widespread agreements in these areas, with about half of the institutions reporting their use:

- Administrative applications and information management: 55 percent
- Telephones and voice services: 53 percent
- Help desk: 50 percent

After those areas, the use of service-level agreements fell off sharply:

- Web services and support: 33 percent
- Printing: 23 percent
- Instructional design and support: 22 percent
- Content management for academic and/or research: 20 percent
- Media services: 17 percent
- Training and other professional-development activities: 9 per cent
- Other: 11%

Do you have formal Service Legal Agreements for the following? (Check all that apply)



Software for administrative applications overwhelmingly comes from enterprise-resource planning vendors, the institutions reported.

Note: *These data are not intended to be considered or used as marketing survey results. It is intended to show general trends and directions from survey respondents. Many vendor applications are specifically sold and designed for a particular segment of the market that may be under-represented in this survey. For example, the percentage of smaller U.S. institutions or proprietary institutions represented in the survey results is much smaller than the percentage of other groups.*

The systems for financials (general ledger, accounts payable, and accounts receivable) top the list of software provided by ERP vendors, with 92 percent of the institutions citing such vendors as the source. Most of the rest said they used "homegrown" applications they developed themselves. Only one institution used an open-source system, and only one outsourced the application.

Financial-aid systems showed essentially the same pattern: 90 percent of the institutions used ERP vendors, and 9 percent used applications they developed themselves.

For other complicated administrative functions, vendor solutions were used by from 80 percent to 86 percent of the institutions, but with a broader mix of "homegrown" and outsourcing for the remainder. (See table below.)

Only grants management showed a broader pattern. While 63 per cent of the institutions used an ERP vendor system, 27 percent used a homegrown approach, with about 5 percent using an open-source system and another 5 percent using an outsourced approach.

The survey asked which vendors the colleges used for financials. Not surprisingly, the largest companies scored the biggest percentages.

The top two accounted for 58 percent of the solutions:

- SunGard Banner: 35 percent
- Oracle (PeopleSoft): 23 percent

However, the next three brought the total for the top five to 87 percent:

- Datatel Colleague: 16 percent
- Jenzabar (all products): 8 percent
- SAP: 5 percent

The remaining 22+ percent of solutions was spread across a wide spectrum, including several open-source solutions.

For student systems, the top choices were:

- SunGard Banner: 40 percent
- Oracle (PeopleSoft): 24 percent
- Datatel Colleague: 19 percent

The remaining 15 percent of vendor solutions were spread among a variety of providers, with only Jenzabar rising above a penetration of 1 percent; its two offerings (CX and SX) had a combined total of 4 percent.

Fund raising and advancement showed more diversity, given the broader range of tools specifically aimed at that field. Blackbaud (Raiser's Edge) was the predominant solution for the institutions in the survey, with 37 percent saying that was their choice.

The two offerings from SunGard were a close second, with the company's Banner software used by 18 percent of the institutions and its Advance software by 11 percent.

	ERP/vendor	Open source	Homegrown	Outsourced
Student registration, grading, and transcripting	87%	0%	13%	0%
Human resources	86%	0.5%	9.5%	4%
Payroll	83%	0%	7.5%	9.5%
Advancement	84%	0.5%	10.5%	5%
Library	80%	3%	7%	10%

Other companies with fund-raising tools included these:

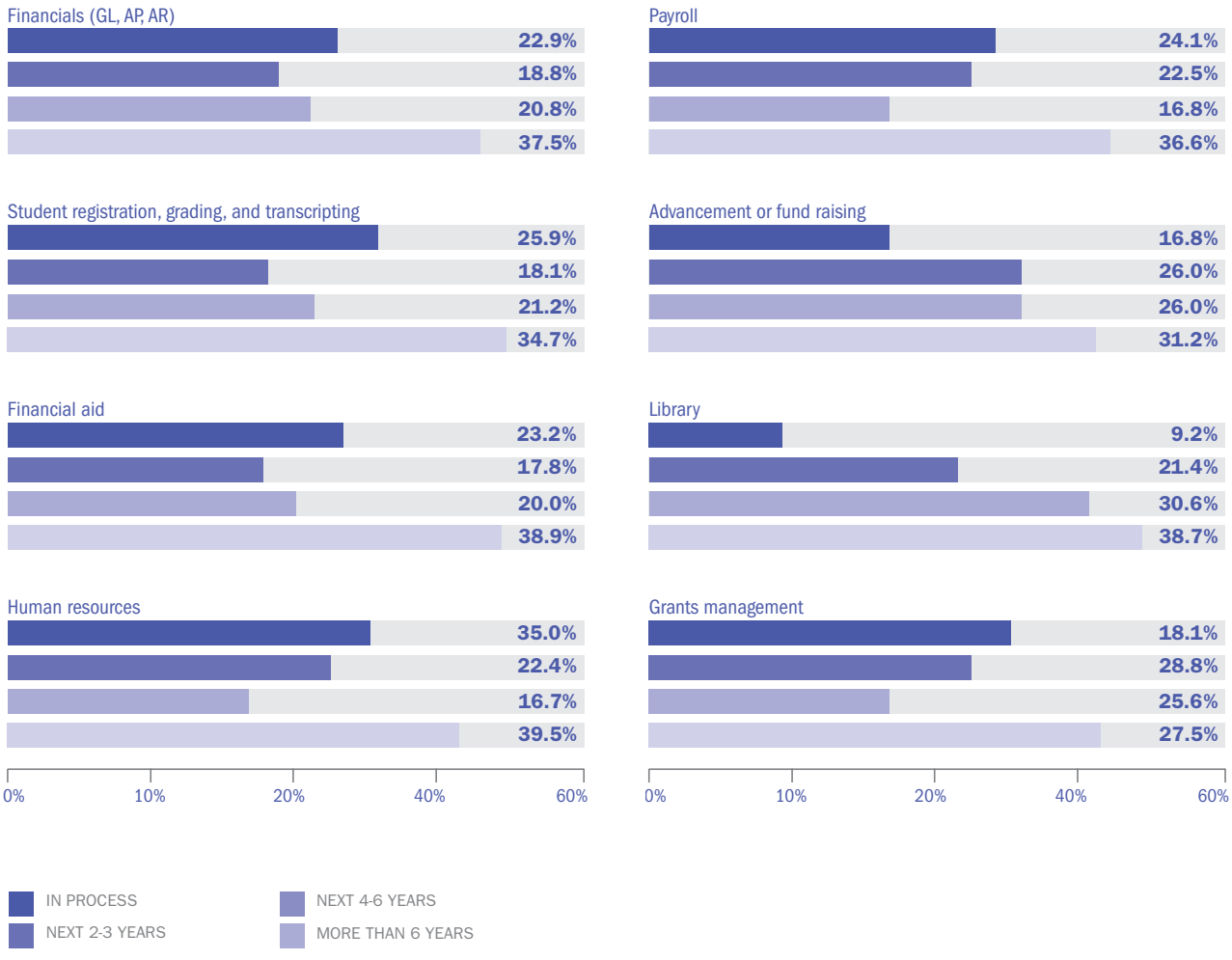
- Datatel Colleague: 10 percent
- Oracle (PeopleSoft): 5 percent
- Sage (JSI) Millennium: 4 percent
- RuffaloCody: 2 percent
- Jenzabar CX and SX: 2 percent

SOFTWARE REPLACEMENTS AND UPGRADES

A major topic for all institutions is when to move from one software iteration to another.

Here the patterns were fairly evenly spread over time:

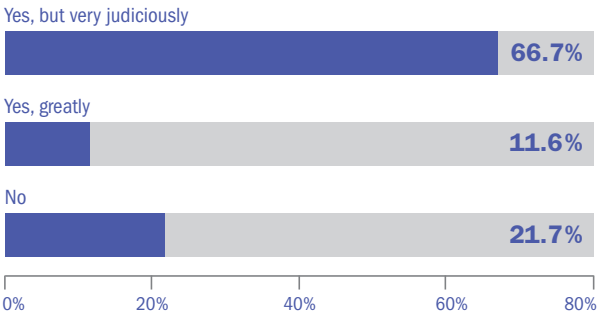
When will you likely replace or make a major upgrade to the following:



MODIFYING VENDOR-SUPPLIED APPLICATIONS

More than two-thirds of the institutions (67 percent) reported that they modify applications—but "very judiciously." Just 11 per cent said that they modify them "greatly," and 22 percent said that they do not modify applications.

Do you modify your vendor-supplied applications?



Of the colleges and universities that modify their systems, 80 percent said that they do the modifications in house. Only 13 percent turn to the vendors themselves for the work, and 7 percent use third-party consultants.

Colleges were also asked how they deploy their various administrative information modules. About two-thirds (64 percent) said that the modules are tightly integrated with each other. Almost a third (31 percent) said the modules are loosely integrated. Only 5 percent said that the modules are not integrated at all.

HOW COLLEGES ARE USING THEIR ADMINISTRATIVE SUITES

How do colleges actually *use* their administrative tools? The approaches vary widely.

Almost half of the respondents said that they use their administrative suite for all administrative information needs. But 43 percent of the institutions added: "We could use it more effectively if we had more time, training, or money."

And 36 percent said: "While it is the core for our information needs, we use other tools to generate information that has been gathered from our administrative applications."

Finally, 21 percent said that "shadow systems," not under the direct control of the IT department, "still play a dominant role in our information needs."

Delving deeper into the state of shadow systems, the survey found that more than half of the institutions (55 percent) say that such systems are discouraged—and an additional 23 percent said that the systems are rare or non-existent. But 22 percent said that shadow systems are common and relied upon for information needs.

The use of shadow systems is decreasing: 57 percent of the institutions said that shadow systems are fewer in number than a few years ago. About 30 percent said that the systems are about the same in number. Respondents were able to choose more than one selection, and about 20 percent said that shadow systems are likely to diminish in importance in the future. But 7 percent said that the systems are growing in number as budgets to support central IT get tight. And 3 percent expect that the shadow systems will grow in the future.

DATA WAREHOUSING

Half of the colleges and universities have data warehousing in place, and an additional 35 percent are making plans to add warehousing. Just 15 percent of the institutions do not have warehousing and have no current plans to add it to their IT infrastructure.

ACADEMIC SOLUTIONS AND ISSUES

COURSE MANAGEMENT

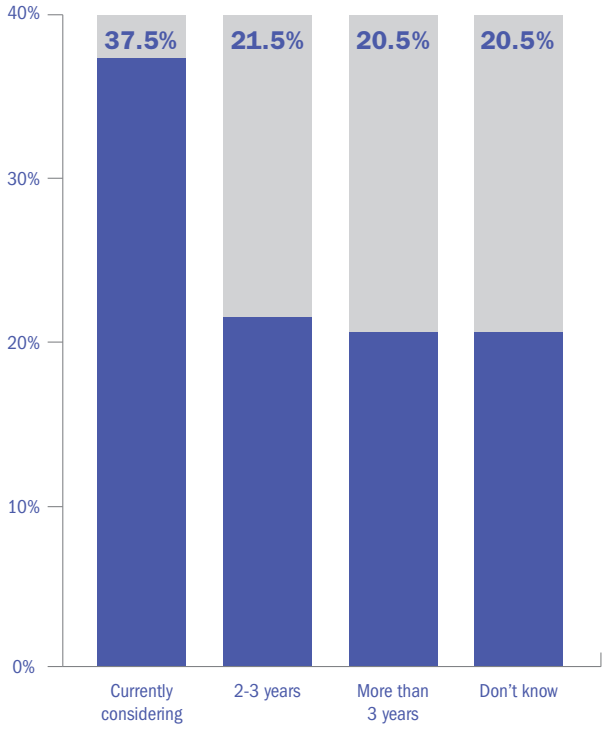
Vendors supply 70 percent of the current course-management systems on the campuses in the survey. But open-source solutions have made some inroads, accounting for 21 percent of the systems. About 6 percent of the campuses outsource their course-management systems, and 2 percent have developed their own systems.

As might be expected, Blackboard, the industry leader, commands a 61 percent share of the current course-management systems being used as the institutional standard. Moodle, an open-source system, accounts for 17 percent of the systems. Angel, which was acquired by Blackboard in 2009, has a 7 percent share. Desire2Learn, a commercial company, has a 5 percent share. Sakai, another open-source offering, has a 5 percent share.

A large number of campuses—38 percent of the respondents—are currently considering replacements for their course-management systems.

An additional 22 percent say they will consider a replacement within two to five years, and 20 percent in more than three years. The remaining 20 percent said they did not know when they would consider a new system.

How soon before you consider a replacement for your current course-management system?



COMMUNITY LABS

Institutions were asked whether they support community labs. More than three-fourths (79%) say that they do. Of those, 24 percent said they continue to increase the number of labs available for general use. Thirty-five percent said that they have about the same number of labs as they had five years ago. And 41 percent said they were not increasing the number of community labs—but are increasing the availability of "hot sites" for people to connect via local-area networks or WiFi.

INFRASTRUCTURE

DESKTOP VIRTUALIZATION

Desktop virtualization is a hot topic on many campuses, with 21 percent of the institutions saying that they are using the tool, and 57 percent saying that it is in the planning stages. The rest of the colleges—22 percent—said they were not using desktop virtualization and that it is not being planned. Of those that reported using desktop virtualization, more than 50 percent listed VMWare, 30 percent listed Citrix, and the rest used several other solutions.

INSTITUTIONALLY OWNED PC'S

Economic conditions do not appear to be cutting into the number of computers on many campuses.

The total number of PC's owned by the institution increased from previous years at almost two-thirds of the colleges and universities in the survey (63 percent). The number stayed the same at about 34 percent. Only 2 percent reported a decrease; the rest did not know.

Timetables for replacing desktop computers varied widely. Thirty-six percent of the campuses said they had increased the time between replacements, while 46 percent said they had not changed the time. Nine percent said they are replacing PC's more frequently than in the past, while 8 percent said that they had no desktop-replacement plan at all.

E-MAIL OUTSOURCING

Half of the colleges and universities surveyed outsource their e-mail for students. Of those, Google is the provider for 25 percent of the institutions, Microsoft is the provider for 20 percent, and 5 percent used another provider.

For faculty and staff e-mail, however, 89 percent of the institutions do not outsource e-mail. For the rest, 6 percent use Google, 2 percent use Microsoft, and 4 percent use another provider.

NETWORK BANDWIDTH

Increases in bandwidth are widespread: 85 percent of the institutions reported that the bandwidth available for students, faculty and staff members, and other constituents increased in the past two years. For the remaining 15 percent, bandwidth stayed the same in the past two years. No institutions reported a decrease in bandwidth.

Sixty-eight percent use tools to shape bandwidth use, while 32 percent do not. Packeteer is the solution for the majority of the institutions, although some use other tools, the most common being Palo Alto.

WIRELESS ACTIVITY

Wi-Fi is prevalent: 73 percent of the colleges and universities said that it is available to everyone on the campus. At a few—6 percent of the campuses—more traffic is handled through wireless connections than through wired connections.

The institutions varied in the extent to which their wireless networks are subject to special security measures.

At 56 percent of the campuses, wireless networks are protected and monitored. At 49 percent, wireless security is part of overall campus security. At 28 percent, Wi-Fi is restricted to certain areas.

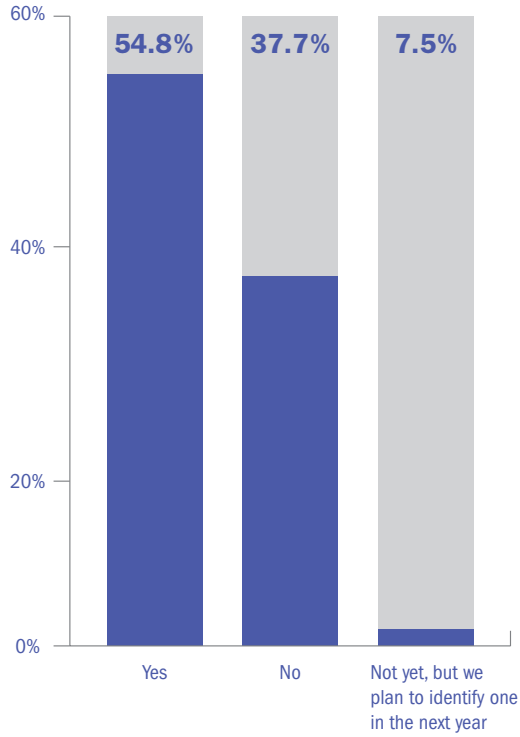
IT SECURITY

Security is a major concern on campuses, and a majority of the institutions in the survey are reflecting that concern in their personnel decisions, financial support, and most expect to continue to need to do so.

SECURITY PERSONNEL

IT support for security—both in personnel and in financial backing—increased in the past two years at 48 percent of the institutions and stayed the same at 49 percent. Only 3 percent of them reported a decrease.

Do you have someone designated as a Chief Security Officer (CSO)?



Fully 55 percent of the institutions have designated a Chief Security Officer (CSO). An additional 8 per cent plan to identify one in the next year. Thirty-seven percent do not have a CSO and have not made plans for one in the near future.

For the institutions that do have such a position, the CSO's at 91 percent report to the Chief Information Officer (CIO) or other leader in the IT unit. Only a handful report to other officials.

SECURITY ISSUES IN THE FUTURE AND AUDITS

Sixty-five percent of the respondents expect security issues to continue to be a major problem. Thirty-five percent expect the issues will stay the same in the future. None expect that security issues will diminish over time.

Seventy-one percent of the institutions have completed an IT security audit, while 24 percent have not done an audit but plan to conduct one in the future. Just 5 percent have no plans for a security audit.

For the institutions that have completed an audit, 35 percent plan to repeat the audit annually or more often; 45 percent plan to repeat the audit every two years or longer; and 20 percent were not sure about the frequency of future audits.

In a similar vein, formal security plans have been adopted by 44 percent of institutions, while 41 percent are working on one, and 15 percent do not have a plan and are not working on one.

Existing plans are updated at least annually by 56 percent of the institutions.

Turning to more specific planning, 77 percent of institutions have a plan to resume mission-critical IT operations in case of a crisis, and 19 percent have such a plan in process. Just 4 percent do not have a plan or a process to create one.

Testing of such plans is performed annually by 27 percent of institutions and more than once a year by 6 percent. But 39 percent test less frequently than annually, and 28 percent have never tested their plans to resume mission-critical operations.

The institutions also vary widely in their ability to recover quickly in the event of a disaster. Some 28 percent have a fully redundant data center that would allow all systems to be up and running in less than a week following a major incident, and 42 percent are planning

such capability. But 30 percent say they do not have and are not planning such a data center.

SPENDING ON SECURITY

Spending on IT security increased over the past five years at 67 percent of the institutions and stayed the same at 25 percent. It decreased at six percent, and 2 percent of the respondents were not sure about spending levels.

These patterns emerged in the spending on IT security:

- More than a 50% increase: 16 percent
- A 50% increase: 8 percent
- A 25% increase: 51 percent
- Stayed the same: 20 percent
- A 25% decrease: 4 percent
- A 50% decrease: 1 percent

A substantial number of institutions either have (11 percent) or are considering (47 percent) implementation of multifactor authentication solutions as part of their security plan.

Among the solutions mentioned were Safeword, VPN, PKI USB, Active Directory, SecurID, IBM Tiviloi, CISCO, CAC readers, LDAP, and Microsoft SmartCard.

CLOUD COMPUTING

Cloud solutions are being used on 46 percent of the campuses in the survey, and an additional 48 percent are considering such solutions. Just 6 percent have no interest in cloud computing.

Here's how cloud computing is being used now:

- Mix of academic and administrative and community-service activities: 41 percent
- Mostly academic (teaching and learning): 36 percent
- Mostly management needs (administrative information): 17 percent
- Community service or outreach: 1 percent
- Not sure: 5 percent

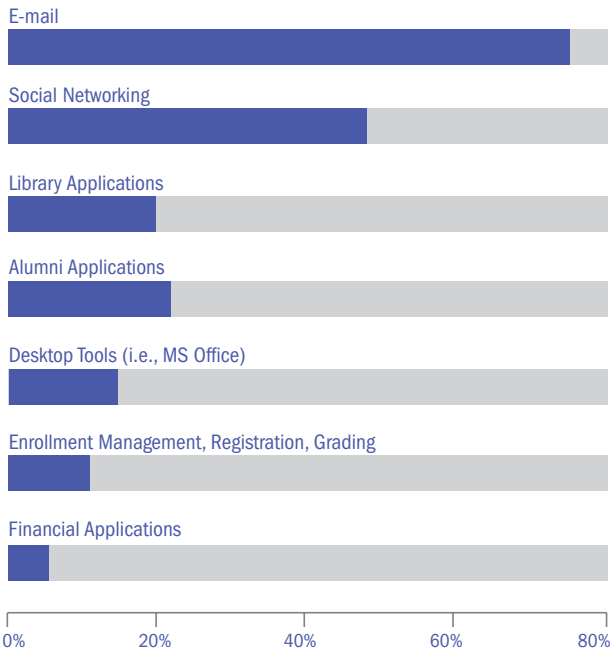
The decision to adopt cloud-computing solutions involved weighing these factors—both pro and con:

- Saving money: 80 percent
- Protection of sensitive data and information: 71 percent
- Concern about security: 67 percent
- Concern about privacy: 65 percent
- Ownership of data: 65 percent
- Ability to bring new activities online quickly: 63 percent
- Access to data and information in the cloud: 55 percent
- Redistribution of IT resources: 52 percent

SOFTWARE IN THE CLOUD

E-mail is overwhelmingly the most prevalent solution that is being used in the cloud or being considered, with 75 percent of the institutions reporting that application.

What is in the cloud? A snapshot of functions campus CIOs reports are now operated off campus.



After e-mail, these areas are being used or considered:

- Social networking: 47 percent
- Library applications: 18 percent
- Alumni applications: 15 percent
- Desktop tools (like Microsoft Office): 13 percent
- Student applications (enrollment management, registration, grades): 9 percent
- Financial applications: 4 percent
- Other: 26 percent (including course-management solutions, project-management tools, and a variety of other solutions)

OUTLOOK FOR THE FUTURE

The survey asked CIO's to list the top three new and emerging technologies they are considering. The answers included a wide range of comments, from tiny to huge. Here are some of them that go beyond specifics in the main body of the survey (such as cloud computing, outsourcing, etc.), and many of which were mentioned by several respondents:

Mobile Computing	49
Cloud Computing	42
Networking Technologies	41
Business Intelligence	26
Virtual Desktop	25
Web apps including Social Networking	20
Desktop Virtualization	19
Video Technologies	17
Security Technologies	17
Learning Management Tech	15
ebooks	10

METHODOLOGY

The Chronicle of Higher Education's Leadership Board for CIO's, working with Dr. Michael Zastrocky and Michael Solomon from The Chronicle, developed a survey for CIO's with a set of questions designed to provide both strategic and tactical information concerning major issues facing higher education CIO's around the world.

Dr. Zastrocky worked with Leadership Board members on content and question development, while Mr. Solomon worked with Chronicle staff members on the logistics for administering the survey. They prepared a list of almost 1,100 CIO's from a diverse group of institutions around the world and sent invitations to them to complete the survey. The online survey was conducted beginning in March 2010. After two weeks, the survey was closed with 236 responses.

DEMOGRAPHICS

Proportion of respondents by type of institution:

- Research universities: 28 percent
- Doctoral-granting institution: 20 percent
- 4-year institution with Master's degree programs: 27 percent
- 4-year colleges with no graduate programs: 13 percent
- 2-year colleges: 12 percent

Proportion of respondents by institution size, based on full-time equivalent enrollment:

- Fewer than 3,000 students: 20 percent
- 3,000 to 4,999 students: 11 percent
- 5,000 to 9,999 students: 18 percent
- 10,000 to 24,999 students: 28 percent
- 25,000 students or more: 23 percent

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