

# Workplace Demographics and Technology

## PART 2

### SECTION III: Critical Issues Facing Higher Education: Technology

Participants at the Thought Leaders symposium agreed that the technology conversation in higher education is no longer about technology. In other words, the discussion has moved away from earlier questions about the importance or role of technology—today, technology has been accepted as an integral, ubiquitous component of higher education. The discussion has moved on to new questions: How do higher education institutions pay for upgrades to their IT infrastructure? How do they make better use of their data? How can they keep up with ever-changing technological innovations and satisfy the demands of students, faculty, and staff?

#### Critical Technology Issues

**Planning, policy, and resources.** Issues of planning, policy, and resources will increasingly challenge institutions, according to Thought Leaders participants. EDUCAUSE recently included strategic planning on its list of Top Ten IT issues of 2011; smart, effective planning has become critical as colleges and universities realize the limitations of their previous IT planning efforts. Technology moves fast, and IT plans need built-in flexibility—just ask those campuses that planned to wire all of their classrooms only to be overtaken by wireless technology. Effective IT plans include a measure of flexibility to adjust as needs, goals and technologies change. Other elements of successful IT plans, according to a recent article in *EdTech Magazine*, include the following:

- **Integration with the institution's mission and goals.** Planners need to understand the implications of their college or university's strategic direction and align the IT mission and goals with the institution as a whole.
- **A focus on need rather than technology.** Today's big tech thing may be forgotten tomorrow, so it is important not to focus on technology for technology's sake. Instead, professionals must focus on the needs and goals of the campus and craft a plan to meet those needs.

- **Coordination with other groups, especially facilities.** IT does not operate in a vacuum. Increasingly, IT plans need to be integrated with the plans for the entire institution, from libraries to labs. They especially need to be coordinated with facilities plans to ensure that both new construction and renovation accommodate IT needs.
- **Collaboration with academic leaders.** The success of IT and facilities managers will be affected by the ability to collaborate effectively with academic leaders.

IT policy is another area of emphasis, one that is sometimes neglected. All too often policy is not addressed until a crisis arises. Savvy institutions are evaluating IT policies on an ongoing basis, since, as technology changes, so must policies about its use.

According to experts Lisa V. Trubitt, Assistant CIO for Policy and Communication at the University of Albany, SUNY, and Kent Wada, Director of Strategic IT and Privacy Policy at UCLA, in a presentation at the 2010 EDUCAUSE conference, IT affects everyone at the institution. So the IT policy process needs to incorporate input from a wide range of parties including non-IT senior administrators. The emphasis should be on achieving consensus on policy issues across the institution. Trubitt and Wada also emphasize the following points:

- Drafting a policy requires an understanding of the issues.
- Without adequate commitment of senior administrators and adequate resources, policy work will languish.
- Professionals should do their best, and test the policy against reality. After a year they should review their work and revise elements as necessary.

Managing flat or decreased budgets is a challenge familiar to every college and university department, and was number one on the EDUCAUSE 2011 Top Ten IT

issues list. IT has shared the pain along with the rest of higher education, although research indicates more in-depth and significant cost measures are still to come. In 2010, the EDUCAUSE Center for Applied Research (ECAR) investigated the impact of the recession on higher education IT with both in-depth interviews and a web survey of member institutions. Surprisingly, the survey found the impact of budget cuts on IT has been

### **Data Point: Technology budgets on the rise?**

*An improving economy lessens the strain on IT departments—except for community colleges*

“The budget cuts that have wreaked havoc on college and university IT units and resources in recent years may be abating. New data from institutions participating in the 21st annual Campus Computing Survey reveal that two-fifths (41.6 percent) of colleges and universities experienced a budget cut in central IT services for the current academic year (2010-11), down from fully half (50.0 percent) last year.

“Private/non-profit institutions generally fared better than their public counterparts; the proportion of private universities reporting IT budget cuts fell by more than half this past year, from 56.9 percent in 2009 to 24.4 percent in 2010. Among private four-year colleges, the proportion experiencing IT budget reductions dropped from 41.9 percent last year to 31.9 percent this fall.

“Although the proportion of public four-year colleges and universities reporting IT budget cuts also declined compared to 2009, the numbers actually went up for community colleges. Almost half (46.2 percent) of community colleges experienced reductions affecting central IT budgets this fall, compared to 38.0 percent in 2009. In contrast, fewer public universities suffered IT budget reductions this year than last (59.8 percent, compared to 67.1 percent in 2009), as did fewer four-year colleges (46.6 percent this fall compared to 62.8 percent in fall 2009).”

**—“IT Budget Cuts Are Down; LMS Strategies Are in Transition,” The Campus Computing Project, October 2010.**

relatively small. Only 53 percent of respondents reported a decrease in IT operating budgets, many less than 5 percent. Of course, some institutions faced much harder times—10 percent saw budget cuts of 15 percent or more. (ECAR also noted that cuts might be worse in FY2010-2011 and going forward, particularly for state institutions.) The greatest challenge identified by respondents to reducing IT costs was the unacceptability of reducing service levels. Other challenges included resistance to change outside the IT organization; lack of funding needed to induce savings; lack of executive sponsorship for change; and the decentralized nature of IT management. In fact, most cost-cutting measures had little to do with IT infrastructure or systems; departments reduced their budgets by limiting travel, implementing hiring freezes, and reducing training as well as implementing cost-cutting measures within IT financial management and portfolio management. According to an ECAR research report, “Higher education IT organizations should strive to sustain their focus on IT cost management and prepare for budgets that will grow slowly and may endure additional cuts. However, the coming years need not be a period of decline and retrenchment for IT.”

**Data management and analysis.** A recurring theme of the Thought Leaders symposium was the need to make better use of data. Higher education IT observers agree: EDUCAUSE has published in recent years more research findings on institutional data management. Colleges and universities lag far behind the private sector in capturing, categorizing, and mining data. Wal-Mart, for example, has been cited as owning the largest civilian databases in the world; the company relies on extensive data analysis to refine the product offerings at each store to satisfy local trends, provide seasonal favorites or even address unique situations. When a hurricane was predicted to hit Florida, Wal-Mart ran the numbers on previous sales at stores in the paths of storms and saw a run not just on tarps and batteries but also beer and pop-tarts. Both were well supplied before the hurricane hit.

Higher education is a long way from making such powerful use of its data. The type of information colleges and universities might glean from their data is impressive: identifying students at risk for dropping out or failing, analyzing participation levels in online courses, tracking performance of sustainability initiatives, and

delivering financial information to key decision-makers. Yet recent research by ECAR found that colleges and universities have a hard time analyzing and drawing useful information from their data. When asked by ECAR if they agreed or disagreed with the statement “We get maximum business value from institutional data,” on average answers fell between “disagree” and “neutral.” Those institutions that had invested in analytics systems generally felt they got greater value from their data than those who did not. In fact, ECAR’s 2009 data management study report frequently states that there is a strong association between the use of advanced analytics and getting business value from institutional data. One of the most significant factors in an institution’s use of data was the support of the senior administration; on campuses where respondents strongly agreed that leadership was committed to evidence-based decision making, the value derived from data was stronger.

ECAR recommends institutions invest in analytics, noting that “given the enormous investments institutions have made in creating powerful integrated administrative systems, it’s remarkable how little progress they’ve made toward building the infrastructure and culture necessary to put their business data to management use.” Institutions also need to build a culture that believes in the value of data and supports data management and analysis. Colleges and universities need to strive to decrease resistance to change and embrace decision making based on solid data.

***Keeping up with trends and meeting user expectations.***

College students walk onto campus with high expectations for technology. They see themselves as consumers whose demands should be satisfied; they expect to get WiFi everywhere, access any institutional resource any time, and work their way using their preferred tools.

As institutions struggle to keep up with these demands—as well as the demands of faculty and staff—colleges and universities also fight to keep up with technology trends. Participants at the Thought Leaders symposium expressed concerns that higher education was falling behind the technology curve. Research supports these concerns. The 2010 21st-Century Campus Report: Campus 2.0 by CDW Government, LLC surveyed more than 1000 students, faculty and IT professionals. The study found that up-to-the-minute technology was considered essential to students; 63

**Data Point: Using academic analytics to identify at-risk students**

***Purdue’s Signals program mines student data to track progress in a course***

One of the most promising uses of data on campus is academic analytics, where the growing amount of information about students generated by course management systems is analyzed for trends in behavior. Purdue and SunGard Higher Education have pioneered a program that makes smart use of this data to alert both students and faculty of potential problems.

Signals applies statistical techniques to the data collected by instructional tools to measure the effort students are putting into a course. The system looks at a number of factors: attendance, quiz and test grades, participation in online discussions, completion of practice assignments, downloading of online course materials, etc. As early as the second week of class, when students log in to the Purdue student website, they see a series of “traffic lights” notifying them if they are in a green (looking good), yellow (at some risk) or red (in danger of failing) group. At-risk students also receive e-mail and text messages and automatic referrals to academic advisors and resource centers.

Signals has achieved significant results; most students, when aware of their risk level, take steps to become more successful. In one course of 220 students, early Signals data showed 45 students in the red level; over the following weeks, 55 percent moved to yellow and 24.4 percent moved to green. In another class, a large Biology course, sections using Signals had 12 percent more B and C grades and 14 percent fewer D and F grades than sections not using Signals. According to Purdue CIO Gerry McCartney, “We found in our research that this can improve student [achievement] an average of one letter grade for many students.”

SunGard began marketing Signals to other colleges and universities in 2010; it was named one of the top ten higher-ed tech stories of 2010 by eCampus News.

percent said that an institution's technology offerings were extremely or somewhat important in selecting a college or university. More than half of students use social media including Facebook, Twitter, blogs and wikis at least several times a month for discussion, collaboration and content-sharing with classmates. However, students, faculty and IT staff see a gap between the potential of technology and its implementation on campus.

IT professionals cite lack of budget as the biggest impediment to technology in the classroom (39 percent of respondents). However, IT staff also point to lack of technical knowledge by faculty and occasional faculty resistance as also hindering the adaptation of technology, with 26 percent citing "professors don't know how to use technology" and 18 percent "professors won't use technology." Faculty agreed that lack of knowledge on how to use technology contributed to the problem (with 18 percent agreeing) but also pointed to lack of technical support resulting in technology not always working (14 percent). Overall, the survey paints a picture of students asking for technology that the IT department and most faculty want to provide, yet budget constraints, lack of technical knowledge and gaps in technical support often get in the way.

Online and blended education delivery strategies may actually change not only the way we use space but how much space we build. This issue absolutely requires the inclusion of Facilities, IT, and Academic leaders at the same table.

## Response from the Thought Leaders Symposium

While significant challenges could get in the way, participants at the Thought Leaders symposium were optimistic that technology offered huge opportunities for higher education. By addressing the challenges head on and applying innovative thinking to the opportunities, colleges and universities could see major new benefits from technology in the next ten to fifteen years.

*How has technology been successfully applied in higher education?* Thought Leaders participants began by considering where technology has succeeded in the past. They identified successes including the following:

- **Student services.** Symposium participants remembered lining up in gymnasiums with punch cards to

## Data Point: Keeping up with mobile technology

### *Institutions look to create new apps to engage students*

Walk across any college or university campus, and every student seems glued to his or her mobile phone, as often as not texting or using a mobile app rather than talking. Today's generation of students relies on their phones—half of all students reported owning a handheld device and accessing the Internet from it, according to EDUCAUSE. Of these, more than half used the device every day.

Yet colleges and universities have been slow to provide digital content specifically designed for phones. It's a challenge: technology moves fast, resources are scarce, and the technical challenge is significant, since institutions would need apps for all of the major phone platforms, iPhone, Android, and Blackberry. An iPad-specific app might be wanted as well.

However, some colleges and universities are taking the plunge. Loyola University, for example, launched Loyola Mobile in Fall 2010; the system allows students to access grades and assignments, search the library catalog and check the University calendar. Loyola has also sought feedback and has developed new resources to meet requested needs, including a system that allows students to arrange transportation to and from campus and a direct connection to campus emergency services.

Other institutions have unveiled their own mobile apps. Ohio State, for example, recently launched an app for sports fans that provides detailed stats, running commentary and instant replays; it's popular with football fans, who use it to get detailed information about games right from the stands. As mobile phones become an ever-more essential tool, more institutions are likely to get on the app bandwagon.

register for classes; now, the whole system is automated and streamlined, takes less time and fewer personnel, and results in few errors.

- **Libraries.** The ease with which students and faculty can identify research resources is remarkable. Online reference databases, fast and intuitive catalogs and easy access to experts has transformed the old university library into a modern research hub.
- **Online learning.** Online courses have gone from a tiny subset of higher education to a critical part of the college experience. More than 5.6 million students took at least one online course during the fall 2009 semester, an increase of nearly one million over the previous year, according to research by the Sloan Consortium; nearly 30 percent of students now take at least one course online. The quality of these courses continues to rise as professors learn how to work with the new medium, and a majority of institutions report increasing competition for online students.
- **Smart buildings.** Adding information and communications systems to buildings has made the job of managing campus infrastructure easier and more efficient. As buildings are connected to an integrated network, facilities staff can monitor and troubleshoot problems from a central location rather than running all over the campus or waiting for someone to call with a problem. Smart buildings also provide powerful built-in energy management services.
- **Automated workflows.** Using technology to automate tasks such as personnel processing, contract management, scheduling, finance and accounting has streamlined many day-to-day operations on campus. While opportunities to increase automation remain, most colleges and universities have made strides in using technology to get information from point A to point B, speeded up routine transactions, and reduced errors and headaches.

*What are the most daunting technology issues and challenges facing higher education today?* There's no resting on one's laurels in technology—another challenge is always right around the corner. And that very fact is one of the major challenges facing higher education: the **rate of change**. New systems, solutions and software are introduced every day, each promising to change the world, each claiming the user cannot do without it. Even discounting those that turn out to be hype, an astounding

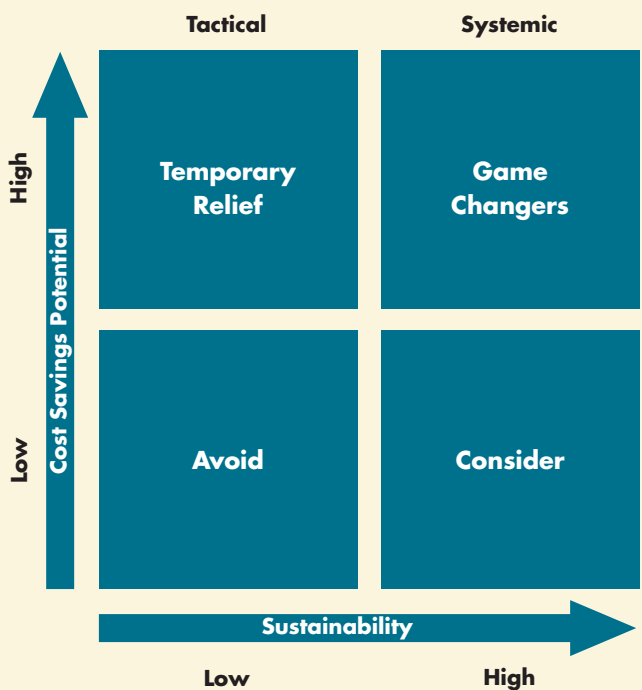
number of promising innovations are routinely unveiled and enthusiastically embraced by at least a portion of the campus population. Even before the recession cut budgets to the bone, no institution could afford to invest in every exciting new development. The blinding rate of change also poses challenges for existing infrastructure, which seems to be obsolete by the time it is installed.

Another major challenge is the integration of data and systems across the campus. Colleges and universities often host a bewildering variety of databases and networks, some of them centralized and carefully managed, others ad-hoc and purely local. Only 11.5 percent of respondents to the 2009 ECAR study of higher education data management said they had an integrated enterprise content management system. High-powered, cutting-edge supercomputers have popped up in individual labs as the cost of systems has decreased. But there is a drawback to all this diversity in terms of inefficiencies, security risks, and facilities costs (servers are energy-intensive systems). It is hard to consolidate and analyze data captured in different ways and stored in different systems, and one-off systems are more likely to be out of date when funding to replace them runs out. Consolidated networks and systems, on the other hand, are easier to maintain and secure, can be mined for insights, and allow for wider integration. A campus cyberinfrastructure that uses established applications, infrastructure, and standards can easily interact with other institutional, regional, or national cyberinfrastructures, facilitating cross-institutional research. Higher education faces challenges in insisting on a common platform because of its tradition of academic independence. Faculty have strong opinions about what they want and often resist the advice of others. IT must make a case for integration and get buy-in from both faculty and senior administrators to succeed.

Colleges and universities must also confront the challenge of developing a long-term funding model for IT. As previously noted, IT has struggled in the face of the same budget cuts that have affected every university department. A greater long-term challenge for IT is that colleges and universities have yet to develop a sustainable budget model for the department. IT departments have turned to short-term solutions such as hiring freezes and training cut-backs to address what is turning out to be long-term budget constraints. In fact, what is needed are structural changes to the way IT provides services to the

**Data Point: Budget strategies for IT**  
*Developing a model for evaluating the merits of cost-savings measures*

An ECAR fellow recently developed a model to assess different IT budget-cutting strategies, noting, “Those approaches with high cost-savings potential but low sustainability are characterized as ‘temporary relief.’ They will provide some savings in the short term, but they are probably not the best long-term solutions. Those approaches with high cost-savings potential and high sustainability are ‘game changers’ capable of creating long-term changes to the cost equation. Those initiatives with high sustainability but low cost-savings potential should be considered, as small savings can certainly add up. . . . Those approaches that have both low sustainability and low cost-savings potential are probably to be avoided, except as a last resort.”



—John Voloudakis, “A Systemic Model for IT Economic Sustainability,” ECAR Research Bulletin, 2010

entire campus. Making such changes can be challenging, but it promises sustainable cost savings that can have lasting benefits. In a recent study of IT budgeting, ECAR listed several strategies that are fertile ground for uncovering cost savings, including prioritizing services for their

importance to the campus, reviewing services to uncover cost-savings using new technology (such as cloud-based computing), standardizing systems to ease maintenance, consolidating hardware, negotiating better contracts with vendors, and communicating changes widely. An overall goal should be for IT “to help reduce operational costs and enable new services across the institution.”

Finally, a critical issue for higher education is the **lack of strategic planning and coordination between facilities and IT**. The work of these two groups should be closely coordinated—ask anyone who has tried to cram modern IT systems into a building designed without them—yet too often IT is only brought into a construction or renovation project after key decisions have already been made, or facilities only involved in an IT project after crucial choices have been set in stone. Integrated facilities and IT planning most often take place when designing showpiece smart classrooms or landmark buildings, but they need to be embraced all the time, for every project. Research published by ECAR points to four areas where IT and facilities fail to connect:

- **Governance.** Campus facilities projects must go through a formal process of seeking input, review, and approval, and IT professionals should be part of the process. Requiring the campus Chief Information Officer (CIO) or his or her delegate to be part of every project review process keeps technology concerns in the foreground of decision making.
- **Approval.** Currently, the CIO is rarely involved in approving facilities projects. ECAR suggests requiring CIO approval of project plans as well as CIO review of projects at their close to ensure that technology is working as expected.
- **Planning.** To ensure that IT needs are communicated to the facilities team and design professionals, IT experts need to be involved in individual project planning. In addition, long-term strategic facilities and IT plans should be coordinated to ensure consensus from the start.
- **Communications.** Even if IT and facilities communicate well during projects, they need other venues. Rarely is there an extended conversation between IT

and facilities—an ongoing effort to understand the needs and concerns of the other party. Both formal and informal communications efforts need to be implemented to increase awareness, build relationships, and form alliances.

*How is the technology environment likely to change in the next five to ten years?* Participants at the Thought Leaders symposium anticipated several key issues to grow more challenging in the next five to ten years. **Energy management** will grow increasingly more pressing as the days of cheap fossil fuels disappear and energy becomes more expensive. IT systems demand enormous amounts of energy, and colleges and universities will need to develop new strategies for obtaining and managing that energy. IT plans must begin to take energy conservation seriously, and facilities managers will need to work with IT managers to find new ways to deliver cutting-edge technology within energy constraints.

A second growing challenge will be **shifts in the way that higher education provides degrees**. Online learning has already changed one aspect of higher education

by introducing a new way of taking courses and even getting degrees. The rising cost of four-year colleges and universities also points to another anticipated shift: a move away from the four-year degree at one institution. More students are expected to take courses at community colleges for two years, and then transfer to a four-year school; calls are also going out for three-year degree plans that would provide the same education with less time and expense. Technology will undoubtedly be critical to ensuring the success of these degree plans.

**Security** will also increase as a demand on colleges and universities. Risks will continue to grow—including risks we cannot even anticipate today—and technology will be critical to preventing, mitigating and communicating those risks. Cybersecurity will also grow more important. The more value institutions place on their data, the more critical security for that data will become.

*What strategies might be employed to respond to technology challenges?* Participants at the Thought Leaders symposium identified several strategies to address upcoming technology challenges, including the following:

- **Build alliances across disciplines.** Increased collaboration between different academic and operational units will be critical to institutional success. IT needs to partner with facilities, facilities with HR, and HR with finance. Turf wars need to give way to partnerships.
- **Outsource to private industry.** The institution is not going to be able to accomplish everything on its own—nor should it. Colleges and universities should turn to contractors and consultants who are experts in their fields; when done right, outsourcing has the potential to improve service while decreasing costs.
- **Focus on your strengths.** At the same time, institutions should concentrate on what they do best. Colleges and universities need to identify their niche—their unique role in the educational marketplace—and then use all the tools at their disposal to refine and perfect their educational offerings in that niche.
- **Manage expectations.** The student as a consumer can only push colleges and universities so far. At some point, the demands of students will become too much

### Data Point: Integrating IT and Facilities

#### *The new demands on facilities managers*

“Real problems can arise when facilities doesn’t have input at the building design and procurement stages. ‘Hopefully, facilities managers are sitting at the table when construction is planned and designed, but it doesn’t always happen,’ says Judy Marks, director of the National Clearinghouse for Educational Facilities. ‘Facilities inherits the buildings and then has to manage them.’ . . .

“How institutions structure the relationship between IT and facilities varies from college to college, but one thing is clear: Gone is the nuts-and-bolts image of the old facilities department. Today’s facilities managers must be as knowledgeable about the flow of systems data as they are about the flow of water on campus.”

—Barbara Ravage, “Tech Gets Physical,” *Campus Technology*, February 8, 2011.

for institutions to bear financially. Campuses will need to start managing expectations of students, parents, faculty, and staff.

**How can innovation be applied to address technological challenges?** Throughout the Thought Leaders symposium participants focused on the idea of innovation and looked for ways to apply innovative thinking to the challenges facing colleges and universities. When considering technology challenges, participants believed **leadership skills** will be critical to future success. Institutions need to develop smart, creative leaders who can assess changing situations, quickly strategize solutions, implement plans, and then adjust those plans as necessary. Institutions should look at providing

leadership training for their administrators as well as creating HR programs that identify those with leadership potential.

Another innovation strategy draws on a point already explored in this report: **operate from data**. Savvy institutions will look for opportunities to gather data, invest in systems for analysis and seek to draw out meaningful information on which to make decisions. The better the data and the more in-depth the analysis, the more institutions will be able to make creative leaps, knowing they have the data to back up their decision.

Virtual systems and cloud computing can also become tools for innovation. Technology has the potential to level the playing field, provide cost savings, expand opportunities for collaboration, and enable advanced services for students, faculty and staff. Cloud computing

### Data Point: Cloud computing and IT innovation

#### *Westmont College turns to the cloud to cut costs and improve services*

In 2008, Westmont College of Santa Barbara, California found itself in the same situation as many institutions: a tight budget, an aging infrastructure and an overwhelmed staff. The CIO, Reed Sheard, starting looking for innovative solutions to its problems and hit upon the concept of cloud computing.

The challenges facing the campus all had traditional solutions. A reduced budget could be addressed with layoffs, the complexity of infrastructure could be managed by increasing redundancy and the need for updated systems could be solved by performing triage to identify the greatest needs and replacing systems as the budget allowed. On the other hand, the same challenges also could be tackled with innovative, even disruptive solutions. The reduced budget could be addressed by changing the business model, the complexity of infrastructure could mean eliminating the infrastructure altogether and the need for updated systems could be handled by replacing those systems with cloud-based solutions.

So Westmont began the process of building partnerships with vendors. Several key systems

needed updating or complete overhaul, including e-mail, e-mail storage, network infrastructure, educational software and college advancement encompassing fundraising and college relations. Over time, the college moved all of these systems off campus. The e-mail and calendar system was moved to Google, the wireless network was turned over to a cloud-based controller, and a new college advancement system was built on cloud-based customer-relationship management program Salesforce.com. With the savings in time and money from these projects, the college had the resources available to make other improvements to its IT system, including developing an iPhone/iPad app.

The results have been significant. Overall, the college saw a 65 percent cost reduction upfront over traditional deployments, and 55 percent cost savings over the lifetime of the solutions. The money saved by lowering procurement and deployment costs provided enough funding to pay for the services for five years. At the same time, IT management time decreased and user satisfaction increased. As CIO Sheard noted, "In these times it is tempting to go with the safe, traditional solutions, but as we at Westmont have found, once you examine the seemingly riskier cloud alternatives, the rewards can sometimes far outweigh the risks."



in particular creates opportunities to transform the entire model of higher education IT by moving key systems and services to “the cloud”; instead of buying software and hosting it on the campus’s servers, the institution partners with a vendor who hosts software on their servers and provides services remotely via the internet. Updates are automatic, costs are transformed from capital expenses to operating expenses, and increases in capacity can be added as needed. Cloud computing cannot solve all of IT’s problems, but it promises to be a technology with innovative possibilities.

## Facilities leaders respond to technology challenges

Participants at the Thought Leaders symposium considered the multiple trends and issues in technology and then evaluated ways facilities departments should respond.

*How is the current campus built environment able to respond to expected technology changes?* Symposium participants began by considering where facilities are today. One critical factor that will help institutions respond to changing technology is the investment in future flexibility. Colleges and universities have made great strides in the last ten years in designing buildings and infrastructure with built-in flexibility. New structures are less likely to be tied to one use and more accommodating of changes in both technology and purpose, teaching style, research focus, and other areas. These buildings will serve campuses well for years to come.

Other advantages on today’s campuses are **smart buildings, systems, and classrooms**. The move toward increased technology in buildings is long-standing and paying off in terms of reduced energy costs and more efficient management. High-tech classrooms, once isolated examples full of technical experiments, are increasingly commonplace and frequently designed with future innovations in mind.

The emphasis on **energy efficiency** in facilities departments is paying off for IT as the overall campus energy footprint is diminished. IT can be an energy hog, but efforts by facilities departments to find energy savings are moving IT groups toward solutions that are less energy intensive. Often, these more energy-efficient ap-

proaches have added advantages. For example, the costly practice of locating servers in each and every building where they must be constantly cooled even if the rest of the building is empty is being replaced by centralization in which servers are grouped in special-purpose buildings. Not only are the energy costs lower, IT departments also find these central server banks easier and cheaper to maintain.

*What changes need to occur to ensure current and future investments in facilities are capable of supporting future technology changes?* In other words, how can senior facilities officers develop buildings today that will work flawlessly with technology tomorrow?

The first step is to **improve coordination between IT and facilities**. Facilities professionals cannot be expected to have a broad sense of technologies looming on the horizon, but it is in their own best interests to engage IT early in the process. IT needs to bring its that knowledge to facilities. This coordination should not be optional—it should be a critical part not only of planning for individual new buildings or renovation projects but also of long-term strategizing. The master plans of the two groups need to be integrated so that they include shared goals, approaches, and vision.

Institutions also need to **improve building flexibility**. While many new structures are more flexible, new structures are still built without consideration for technology trends. Buildings need to be more modular and reconfigurable so that they can be adapted no matter how the needs of the institution change. Flexibility needs to encompass not only individual buildings but also the entire campus infrastructure. Communications and energy systems will continue to evolve in the next decades, and smart institutions will be ready for that evolution.

Finally, colleges and universities need to apply the concept of **total cost of ownership** to all of their campus facilities projects. Total cost of ownership means evaluating not just the cost to build a structure but also the cost to maintain it over time, including energy costs, program retrofits, IT upgrades, and, eventually, the costs to decommission and dispose of the facility. Adaptable, easily-upgradeable buildings might cost more to build in the beginning, but they will actually cost less over time if they do not require expensive renovation or retrofit every time technology evolves or the institution’s needs change.

## The strengths and weaknesses of higher education when confronting technology transformations, and strategies institutions should use to respond

The success or failure of institutions addressing technology will depend greatly on the strengths and weaknesses of those institutions. Symposium participants considered strengths and weaknesses along with strategies for success.

**Strengths of higher education.** The advantages that college and university facilities bring to the table include the following:

- A structured design process. Facilities departments have in place a detailed process for soliciting input on the design of new buildings. This process can easily be adapted to include IT considerations.
- Openness to and familiarity with technology. Facilities staff work with advanced technology every day. New smart buildings and structures designed to meet high LEED standards (U.S. Green Building Council's Leadership in Energy and Environmental Design) require sophisticated technology, which facilities employees have mastered.
- A well-constructed campus. Colleges and universities generally build for the long term. Most campuses were constructed following strong design guidelines that have held up over time. Even buildings designed before the era of modern technology have remarkable integrity.

**Weaknesses of higher education.** Factors that will limit the ability of institutions to meet future technology challenges include the following:

- Aging infrastructure. Despite the integrity of many older buildings, outdated buildings and systems nevertheless pose a challenge for colleges and universities. Adding new technology to these buildings can be an expensive hassle, and the expense of maintaining these buildings puts a drain on facilities resources.
- Piecemeal approach to planning. Few institutions integrate IT and facilities planning. In fact, some institutions fail to prepare and follow effective plans for either department. Without a clear sense of direction, institutions struggle to find the right path.

- Risk-aversion. With respect to their campuses, colleges and universities are generally cautious and conservative. Costs are high, resistance to change is high, and allegiance to old buildings runs deep. New or different approaches to campus structures go against the instincts of many within the campus community.
- Outdated structures. Teaching and learning models in higher education need to change both because technology opens up new possibilities, and cost models of delivery need to change if institutions are to survive. Cutting-edge science laboratory/teaching buildings (such as the University of Minnesota's new biology building and St. Cloud State University's Integrated Science and Engineering Laboratory Facility) are good examples of the change that is needed. Other disciplines have been slower to embed new learning, and outdated structures are making the implementation of essential innovations difficult to achieve.

**Strategies higher education can use to respond.** Finally, symposium participants considered the best approaches to technology challenges.

- Integrate IT and facilities planning. This one step would solve numerous problems and create new opportunities for smart IT and facilities joint efforts.
- Increase professional development and IT training. Facilities staff need to keep up with technology trends. The best way to keep skills fresh is to provide regular training with capable, engaging trainers.
- Plan for flexibility. Those responsible for new buildings and building renovations should make flexibility a goal. Buildings should be designed so that, even as pedagogy evolves and technology changes, the structures remains functional.
- Use data to make decisions. Transforming higher education into data-driven organizations will take time, but it will increase the effectiveness of institutions.
- We must recognize the scale of the challenge and the changes that we will have to make in how we discover new possibilities and make decisions. More attention needs to be given to environmental scanning and making a way for outside ideas to penetrate our planning.

## SECTION IV: Top Ten Higher Education Facilities Issues

**H**ow the top ten issues were identified. The premise of the Thought Leaders Symposium is that facilities leaders have an important role to play in solving the challenges facing higher education. Ten issues were identified by symposium participants which are expected to be the most significant in the next five to ten years. In addition, participants developed critical questions related to those issues. The questions are the heart of the exercise: they are intended to guide facilities managers and university leaders in discussions of these issues on individual campuses.

One important point: readers of the previous Thought Leaders reports might notice some changes to the list. Issues not carried over from the previous years have not gone away as priorities. Instead, the issues identified each year are those that arose in discussion as the most critical at this time.

### 1. Establish a culture of innovation and collaboration.

**The Issue:** Higher education needs to transform its employees to be more open to innovative thinking and collaborative processes. This can lead to a change in culture.

#### Strategies:

- Take a close look at your organization and assess the current acceptance of innovative and collaborative thinking.
- Identify policies, practices, structures, and beliefs that are getting in the way of innovation.
- Start with small, manageable, measureable projects, then build on your successes.
- Include the academic community in planning and programming discussions around the pedagogy as it relates to the built environment.

While many great innovations in science, engineering and business have emerged from colleges and universities, institutions are frequently some of the least innovative and collaborative places. Administration on most campuses can be stifling, bureaucratic, obsessed

with detail and skeptical of change. A lot is at stake—money, time, reputation—and institutions respond by growing increasingly risk-averse.

But change is needed on today's campuses to address the serious problems facing institutions, problems including drastic cuts in state support for public schools, resistance to high tuition, and shifts in the expectations and needs of students. Bureaucratic, risk-avoidant decision making will not get the job done. Institutions need to embrace creativity, innovation, and collaboration.

Unfortunately, some of the barriers to innovation identified by industry experts are too complex to be tackled in a single department or even on a single campus. One recent paper, "Barriers to Innovation in Higher Education", by Dominic J. Brewer and William G. Tierney, pointed to the following as the most significant limiting factors for innovation:

- **Current funding mechanisms provide weak incentives for innovation.** State subsidies are loosely tied to enrollment and not linked to results, and there is no financial reward for innovative strategies. In addition, state funds are tied to operational requirements—there is no higher education equivalent to K-12 charter schools.
- **Federal/state regulations can provide important consumer and employee protections but also dampen innovation.** Regulations hinder new entrants to the field and obstruct the spread of online education.
- **Accreditation has evolved slowly.** Accreditation tends to foster risk-aversion and standardization. It is largely process-based versus outcomes-based—that is, it measures credit hours rather than learning.
- **Faculty governance and contracts may no longer be a source of strength.** Shared governance has become a tedious process akin to labor negotiations. In addition, if faculty do not benefit from an innovation, it is tough to sell.

So what can an individual or small group do when faced with such systemic challenges? The only solution is to start small but think big. A small step toward collaborative, innovative thinking may provide the confidence for greater risk-taking and teach important lessons on how to make innovation succeed. Consider a persistent problem, a point of contention or frustration that has long been a campus headache. How can you think about this problem in a new way? Who on campus can come together to look at this problem from different perspectives and come up with creative solutions? How can you remove the long-standing constraints that have gotten in the way of managing the problem?

An important step is to understand where you are today. Institutions need to take a close look at the practices, policies, beliefs and traditions of their organization and ask how they are either encouraging or inhibiting innovation. Think about innovative proposals in the

past—how did they fare? What enabled successful projects to move forward, gain acceptance and thrive? What got in the way of other innovations finding success?

Another critical step is to develop measurable goals. Broad goals such as “increase collaboration between IT and facilities” sound great on paper, but how do you know if you have succeeded? Consider ways to measure progress and include periodic reviews in your plan.

**Questions for institutional dialogue:**

- How do we define collaboration? Innovation?
- How does the campus organizational structure and/or policies encourage or inhibit collaboration and innovation?
- How do values and beliefs encourage or inhibit collaboration and innovation?
- What mechanisms are in place for idea exchange?
- How do we move from concept to execution?

**Data Point: Innovation on campus**  
*Questioning long-held assumptions about the purpose of higher education*

A recent report for the Center for American Progress and the Innosight Institute looked at how the structure of higher education discourages innovation and asks some hard questions about the purpose of colleges and universities.

For example, is the primary mission of the institution to educate students and move them toward a degree or is to produce research? Analyzing the structure of traditional institutions, the authors assert departmental organization is intended to “optimize the ability of faculty to publish.” In contrast, for-profit, online institutions are designed to “optimize the flow of students through the university.” While noting the significance of research institutions, the authors point out the traditional structure is far less efficient in terms of getting students to a degree:

A typical traditional university incurs operating deficits of 10 percent of revenues, even while Laureate [owner of Walden University] and Apollo [owner of the University of Phoenix] both report

operating profit as a percentage of sales to be roughly 30 percent. The cost advantage of these disruptive low-cost universities, in other words, is more than 40 percent even as they often charge roughly the same tuition as those four-year traditional universities.

Another important question, particularly for state legislators, is whether their responsibility is to “facilitate the best possible postsecondary education and training for the people in the state or whether they are appointed to be the caretakers of the specific institutions that have historically provided higher education.” Historically, these two goals were seen to be synonymous, but that might not always be the case. Should a historic institution with passionate alumni but poor track record be preserved? Or should that money go elsewhere?

—Clayton M. Christensen, Michael B. Horn, Louis Caldera and Louis Soares, *“Disrupting College: How Disruptive Innovation can Deliver Quality and Affordability to Postsecondary Education,” The Center for American Progress and Innosight Institute, February 2011.*

- How do we know we've improved? What sort of benchmarks and metrics can we put into place to measure progress?
- How do we engage the academic community in innovative ways of delivering learning?

## 2. Improve productivity with level or decreasing resources.

**The issue:** Colleges and universities need well-considered, measurable, and transparent strategies to get more done with less.

### Strategies:

- Understand your institution's core mission and focus your efforts there.
- Develop metrics to measure your progress.
- Look for advantages from technology.
- Empower your employees by increasing flexibility and accountability.

Economists say the recession is ending, but budget woes for colleges and universities are not going away. State appropriations for higher education will be even lower in some states in the next few years as federal stimulus funds run out. The National Governors Association and the National Association of State Budget Officers predict state shortfalls for 2011-2012 to reach \$127.4 billion. At least 31 states predict budget gaps, according to the National Conference of State Legislatures, with nineteen states expecting gaps of 10 percent or more of their general fund budgets. Proposed cuts to higher education range from \$314 million in New York, to \$325 million in Arizona, \$660 million in Pennsylvania, \$969 million in Texas, and \$1.4 billion in California.

Meanwhile, most private colleges and universities (79 percent) expect to see increases in their tuition revenues for FY 2011-12, but the rates of increase are generally flatter than in previous years and often offset by significant tuition discounting. A 2011 report by the National Association of College and University Business Officers found that discounting and financial aid reached unprecedented levels for private institutions. The average tuition discount rate for first-time, full-time freshmen was 42.4 percent in 2010, a jump from about 39 percent in 2007, while a record 87.5 percent of all first-time, full-time freshmen received financial aid compared to around 80 percent in the seven years preceding 2009. As a result,

net tuition on average grew by less than 2 percent in 2009 and just under 3 percent in 2010, a significant drop of the average increase of 4.2 percent from 2001 to 2007. "That means that institutions did not gain nearly as much revenue as their tuition increases would suggest, and that many institutions saw gains in tuition revenue that lagged the inflation rate," noted *Inside Higher Ed*.

Facilities departments will take the hit along with everyone else—so what are they to do? Many are already smarting under several years of budget cuts, hiring freezes, and delayed maintenance. The key will be to increase productivity.

This sounds like an overwhelming proposition, but in fact it is an opportunity to focus your efforts and embrace innovative thinking. A critical step is to assess your mission. It is easy for organizations to take on tasks over the years that then become routine and expected—even though they do not contribute to the mission. Senior facilities officers need first to clearly understand what is required of them and ensure that those requirements are aligned with the institution's mission and vision. Then they can prioritize the work of their employees based on their contribution to that mission.

A second important step is to establish metrics that will allow you measure your progress. Can you find new ways to assess how well you are fulfilling your mission? With new metrics and a steady source of data, you can see where you're falling short as well as where you're succeeding. Technology can be an important tool in the search for and use of metrics, and facilities professionals should also look to technology to improve productivity. Investments in smart building systems, for example, can improve building efficiency, provide critical data on building performance, and save workhours in maintenance and monitoring.

Finally, senior facilities officers should look for ways to increase employee accountability. Employees should be empowered to have more flexibility in how they get their jobs done and given more opportunities to speak out about opportunities for cost savings or improved productivity. Those employees who step up to the challenge and find ways for the institution to get the job done should be rewarded.

### Questions for institutional dialogue:

- What are the requirements and expectations of facilities to support the mission of the institution?

**Data Point: Budget woes for state colleges and universities**

*Situation not improving any time soon*

“While fiscal 2012 may mark a turning point in state fiscal conditions, spending and revenue collections are unlikely to return to prerecession levels for a couple more years in a number of states. The slow economic recovery and the wind-down of Recovery Act funding in fiscal 2012 will continue to present states with an environment of tight fiscal conditions even after significant cuts and the enactment of new taxes and fee increases.”

—“*Preliminary Summary: Spring 2011 Fiscal Survey of States,*” *The National Association of State Budget Officers, May 31, 2011.*

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- What is the targeted/desired outcome?
- What metrics best quantify facilities requirements and expectations? What should be monitored and how?
- What resources are available to start?
- How can we use technology to improve productivity? Where will technology investments have the greatest payoff?
- How do we empower employees to contribute to the process? Can we increase accountability as well as flexibility?

**3. Leverage technology to improve decision making.**

**The issue:** Colleges and universities need to do a better job gathering and analyzing their data to make solid and consistent business decisions.

**Strategies:**

- Promote the concept of data-driven decision making to campus leaders.
- Identify business functions and decisions that could be supported with better data access and analysis.
- Determine current sources of data and evaluate any barriers to using that data.
- Support employee training for data evaluation.

Participants at the Thought Leaders symposium believed that data is the great untapped resource of colleges

and universities. Institutions automatically collect vast amounts of data, but they make little use of it to drive business decisions. Even more data is uncollected and unusable. The savviest and most successful corporations rely on their data to understand their customers, deliver the best products and services, and streamline their operations. Colleges and universities that embrace this same attitude would have a powerful tool to help them compete in the increasingly tight higher education market.

Some institutions have seen the value of their data and made investments in data management and business intelligence systems that have achieved significant results in cutting costs, identifying trends and supporting business decisions. Consider the following examples:

- Miami University of Ohio used business intelligence tools to improve the financial viability of its summer academic programs. By combining information from accounting, registration, and financial aid systems, the university gained a big-picture view of summer students and courses and was able to make critical decisions to cut the budget.
- Johnson County Community College in Overland Park, Kansas, implemented a project management system for its IT department that has resulted in more efficient project development and management. Proposed projects are prioritized to ensure those with the greatest impact get the most attention.
- Lincoln Memorial University in Harrogate, Tennessee, used advanced statistical tools to determine the most successful recruitment strategies for the institution. Strategies believed to be sure-fire hits turned out to be duds, while unexpected efforts had remarkable results.

For all these institutions, the first step was to embrace the idea of data-driven decision making. Without a high-level commitment to data as a critical tool, these projects will never get off the ground. One way to build support is to start small with a manageable project that can have solid results. That’s why Miami University began by looking at summer session data. “Having a real-life example of how we could use data to support decision making helped the general university community understand the value of business intelligence,” said

Beverly Thomas, associate VP of finance and associate treasurer. “It made it less theoretical.” Another important early step is to identify areas that could benefit from better data. These will often be activities or functions where the institution needs to cut costs, improve productivity, or solve a problem. For Johnson County, that meant tackling widespread frustration with the IT project management process; for Lincoln Memorial, this meant focusing on recruitment, where the institution had set a goal to become more selective and enroll more high-achieving students.

### Data Point: Making smart use of data

#### Adapting the ideas of today’s savviest online companies

Colleges and universities are looking to the world’s most successful companies to improve their interactions with students.

For example, Austin Peay State University in Clarksville, Tennessee recently unveiled a system that recommends courses to students based on their major, past academic performance and performance of other students in the class. The system operates a lot like the recommendation systems used by Netflix and Amazon to promote books and movies, and in early tests it has shown to lead to higher grades and fewer dropped classes.

Meanwhile, the University of Phoenix recently rebuilt its entire learning platform from scratch, incorporating many of the innovations of social networking sites as well as a complex, in-depth data platform. The goal is to create a system that profiles student behavior and personalizes how individual students are taught. Recommended learning activities will be based on how students learn, what they’re struggling with and where they need help.

— Jeffrey R. Young, *“The Netflix Effect: When Software Suggests Students’ Courses,”* *The Chronicle of Higher Education*, April 10, 2011 and Josh Keller, *“Borrowing From Tech Industry, U of Phoenix Rebuilds Its Learning Platform,”* *The Chronicle of Higher Education*, February 6, 2011.

Often colleges and universities have the data they need to make better decisions, they just aren’t using it. Institutions need to identify their stores of data and find ways to get it out of its silos and into a form that makes sense for users. This can be a technically challenging task, and rarely will institutions have the right staff on hand to do it all themselves. Finding the right vendors with whom you can partner is essential for most colleges and universities. Data experts can help identify barriers to data integration and point the institution to more efficient capture and use of information.

#### Questions for institutional dialogue:

- Who on campus supports the idea of data-driven decision making? Who is skeptical? What core group of advocates could promote the concept across the campus?
- Where is the institution already using data effectively? Can these programs be expanded?
- What critical issues or problems could be addressed with better data analysis? Are these issues essential to the institution’s goals or mission?
- What data is the institution already collecting? Where is this data stored? What barriers are getting in the way of making use of this data?
- Do we have trusted vendors to guide us through the process of adopting business intelligence systems?

#### 4. Align IT and facilities.

**The Issue:** Information technology and facilities departments need to do a better job of coordinating their goals, plans and projects to improve the success of both groups.

#### Strategies:

- Determine what is getting in the way of facilities and IT working more closely together.
- Reach out to IT managers and staff to gain agreement on the importance of better coordination.
- Develop processes that will improve alignment.

Throughout the Thought Leaders symposium, the importance of better coordination and alignment between IT and facilities kept returning as a theme. Most attendees could cite a project where lack of coordination had costly, time-consuming, stress-inducing results. Participants described having to drill through concrete walls to add conduits and fighting over closet space needed both

for maintenance staff and for servers. No one expects a 60-year-old building to be technology ready, but there is no reason new construction or renovation projects should have these problems. Some simple communications and coordination would make both IT and facilities more successful.

One area of emphasis that could benefit from increased IT/facilities coordination is energy management. Technology in general and servers in particular are energy-intensive systems, requiring not just electricity but also expensive air conditioning. Lack of coordination makes the situation worse. Facilities managers complain that either IT or individual academic units sticks servers in closets, taking away much needed space and requiring an entire building to be air-conditioned to keep that one closet cool; these server closets often require 50 percent more energy than the same amount of resources at a centralized data center. Facilities staff also argue that IT is only responsible for the upfront cost of servers and other IT infrastructure, not the electric and cooling bill, so there is no incentive for IT to invest in more efficient systems. On the other hand, IT managers point out they often have no way of measuring their power use since data centers are not individually metered.

The root of the problem is often neither IT nor facilities but rather faculty and research groups eager to have physical control of their own servers, but the situation poses an ideal opportunity for facilities and IT to work together for a better solution for the entire campus. Many institutions are turning to data center consolidation, where servers are grouped into one or a few specially designed locations that feature best practices in energy management and air handling and include only the most up-to-date, energy-efficient systems. A recent survey by CDW found that 79 percent of colleges and universities either had or were developing a data center consolidation strategy with the goals of both reducing expenditures on hardware, software and operations and reducing energy consumption. Other key steps that can help in this process include:

- Coordinate to develop metrics for IT energy use. Some data center functions can easily be measured with free tools provided by the EPA and the U.S. Department of Energy—CDW found that only 25 percent of IT managers were “very familiar” with

these programs. Other steps to manage energy consumption might require coordination with facilities.

- Consider outsourcing. One radical solution to data center problems is to get rid of them altogether. Thousands of colleges have already signed up for e-mail and calendar services through Google Apps, eliminating the need for servers that previously hosted these systems. Outsourcing research data may prove to be more complicated, since it would require not just data processing on an unpredictable schedule but also moving large chunks of data. But any means of reducing the number of servers on campus should be supported by both IT and facilities.

Data center consolidation is only one prime example where increased IT and facilities coordination could have resulted in significant savings and better services for campuses. The first step in all of these situations is determining what is getting in the way. Leadership management should look at processes, policies, budgets, and beliefs to understand where the roadblocks are. The next step is to forge connections between departments. This does not have to be an elaborate process in the beginning. If the senior facilities and senior IT officers had lunch once a month, it would be a great start. You need both formal coordination and informal relationships to succeed. Finally, the departments should work together to develop processes that will improve alignment. Look for metrics along the way that you can use to measure your progress.

#### Questions for institutional dialogue:

- What is the current relationship between facilities and IT? Are there any formal points of contact, coordination, review or approval? What about informal relationships that could serve as a starting point?
- What are the roadblocks getting in the way of effective alignment? Are any policies interfering with coordination? What about institutional attitudes and beliefs?
- Are the mission and goals of the two departments in alignment?
- What are some concrete objectives of better IT and facilities alignment? Can we apply metrics to those objectives? How will we know when we have succeeded?



## Data Point: IT and energy management

### Findings from the 2010 Energy Efficient IT Report

IT managers place increased importance on energy-efficient technology

- The percentage of IT managers who believe that energy efficiency is a very important consideration when purchasing new IT equipment has rebounded significantly during the past year – from 34% in 2008, down to 26% in 2009 and back up to 39% in 2010

Organizations are consolidating data centers and innovating to reduce energy use

- 79% of organizations currently have or are developing a data center consolidation strategy. Many cite energy reduction as a top driver.

Their efforts are paying off

- 74% of organizations have or are developing programs to manage and reduce IT energy use
- Of this group, 56% (up from 39% in 2008) have reduced their IT energy costs by 1% or more

Still, many struggle to allocate funds for energy-efficient IT programs

- Managers explain that they have too little budget left for new, more efficient IT systems after meeting internal client demands. They also find that senior management gives higher priority to investments in other areas of the organization

—“CDW-G 2010 Energy Efficient IT Report,”  
CDW-G, 2010.

- What processes and policies need to be revised to make alignment a reality?

## 5. Create a new budget model for IT and facilities.

**The Issue:** Institutions need to coordinate not just IT and facilities planning but also budgets to ensure both groups are working toward the same goals.

### Strategies:

- Evaluate the current level of budget integration between IT and facilities—for example, are incentives available to IT to reduce energy costs?
- Understand barriers to changing the budget model.
- Seek buy-in from both IT and administration leadership.
- Consider interim steps that could help prove the need for better financial integration.

It is not enough for IT and facilities to coordinate their planning and operations; they also need to align their budgets. Today, at most institutions, the finances of the two departments are completely separate, creating unintended negative consequences that can get in the way of improving the effectiveness of both groups.

Take the example of data centers from above. Part of the problem cited at many colleges and universities is that there is no incentive for IT to spend more money for energy efficient systems. Relatively cheap servers distributed around the campus cost the IT budget very little—or, in fact, cost IT nothing at all because they are funded from department budgets—but they put a huge drain on the facilities budget. Conversely, consolidated, energy-saving data centers require investment from the IT budget, but the savings to the electric bill will help the facilities budget. If there is no financial incentive for IT to invest in energy efficiency, why would a cash-strapped IT department bother?

A better solution is to create a link between the IT and facilities budgets so that savings in one area help everyone. At some institutions, IT departments that can prove their purchases save money on operational costs can recoup some of those savings—but this is quite rare. A recent survey by ECAR found few colleges and universities offering any financial incentives for environmental sustainability initiatives. Only 9 percent offered incentives for adopting alternative sources of electrical power, 5.7 percent for minimizing growth in electrical energy usage and 3 percent for complying with LEED standards. The survey also found that IT is often only marginally involved in green initiatives on campus and rarely have measurable goals for increasing sustainability. While 53 percent of institutions had a stated goal of minimizing growth in electrical energy use, only 35 percent had a system in place to measure their progress; 47 percent had no goal at all. Most IT directors are striving

to reduce consumption—75.1 percent had initiatives underway—but without set goals or any financial incentives, these efforts may stumble when budgets are cut and priorities shift.

One model for combining not just the efforts but also the finances of IT and facilities is provided by Stanford, where the Sustainable IT office is a joint effort of both facilities and IT and reports to both departments. The goal of the office is to reduce the greenhouse gas emissions generated by IT infrastructure by reducing the energy needed to run the computing infrastructure, the cooling needed to keep equipment running, the energy used to build the systems, and the electronic waste produced when equipment is disposed of. Since its creation in 2008, the office has implemented programs to reduce the energy consumption of desktop and laptop computers, saving more than 2 million kWh/year, improved the efficiency rating of its data centers, and is in the process of building a cutting-edge computing center that will save the university \$3.2 million per year in energy costs over 25 years.

Important steps in creating a new budget model will include identifying critical stakeholders, building support for the concept, and developing strategic goals for what is to be accomplished. Such a major shift will require buy-in from both departments as well as administrators across the institution. A strong financial case for integration will be essential, so research will be needed. A look at the constraints that are getting in the way will also be necessary. These will certainly include long-standing organizational structures as well as firmly held beliefs about how the institution should operate.

This process will be lengthy, but some preliminary steps can help to make your case. For example, the ECAR study found that the majority of IT directors had little knowledge as to how much energy their systems used. Facilities can work with IT to uncover this information in several ways. One instrument is an energy audit: while some colleges and universities (40.5 percent) conducted at least partial audits in the past year, only 12.4 percent audited their entire energy usage. Many IT professionals, on the other hand, reported either no audits in the last year (28.9 percent) or did not know whether an audit had taken place. (28.2 percent). Another solution is to start metering energy usage and at least informing departments of their consumption if not billing them for it. Currently, 83.7 percent of colleges

and universities neither inform nor bill departments for their energy use: 9.4 percent were not billed but were informed, while only 3.3 percent were actually billed for their energy consumption. If IT and individual departments knew how much technology was costing the institution—and themselves—they would be more motivated to take action. Metering is a task that facilities departments can undertake on their own: it can have significant impact in convincing others of the importance of both working together and creating a new structure for budgeting.

#### Questions for institutional dialogue:

- What are the unintended consequences of lack of coordination or incentives for IT?
- What do we want to accomplish with a new budget model? What are our goals?
- What are the current constraints to better integration?
- Who are the stakeholders who would be necessary to achieving better integration? What is their current attitude toward IT/facilities alignment?
- What steps would need to take place to achieve alignment? What model would work for the campus? Are incentives an option? A joint office? A new system entirely?

#### Data Point: Energy consumption and IT

##### *Lack of information seriously hurts IT efficiency efforts*

“The absence of metrics about our own electrical power consumption is one of the biggest barriers we face in getting heavily into ES [environment sustainability] projects. We don’t know how much electricity we use now; we don’t see the bills because our facilities aren’t sub-metered. We can guess at our usage, but we’d be much better off if we could see the numbers.” – Sharon Blanton, CIO of Portland State University.

—Mark C. Sheehan and Shannon D. Smith,  
*“Powering Down: Green IT in Higher Education,”*  
 ECAR Research Study, 2010.

- What incremental steps could be used to inform campus leaders about the issues? Are energy audits an option? What about sub-metering?

## 6. Confront shifting workforce demographics.

**The Issue:** Institutions need to take active steps to prepare for an increasingly diverse workforce.

### Strategies:

- Understand the demographic shifts expected in your region.
- Implement cultural competency training before you experience problems dealing with race, ethnicity or culture.
- Partner with others in your community or region to increase recruitment and training among diverse populations.

The college and university workforce of tomorrow will be significantly more diverse than that of today. Research makes clear the magnitude of the shift. To recap from previous sections of this report, the caucasian proportion of the population will decline steadily in the next few decades, while the Hispanic- and Asian-American populations will grow dramatically.

How will colleges and universities in general and facilities departments in particular prepare for this change? Demographic shifts are highly localized, and the transformations expected in one region may be very different from those in another. Senior facilities officers would be wise to take a look at the demographics of their own area: Does the workforce reflect the surrounding community? If it doesn't now, it probably will. These campuses should make extra effort to prepare for more diversity.

Institutions should also consider attitudes within the workforce. It's better to assess and address issues of race, ethnicity and culture than let them simmer under the surface. Human resources experts use the term "cultural competence" to describe the skills, attitudes, policies and structures within an organization that enable that organization to work effectively in a context of cultural differences. Efforts to increase cultural competence can include diversity training, mentoring programs, and partnerships with community and social service

organizations. Research on a six-city program by the Annie E. Casey Foundation to help disadvantaged, low-skilled workers secure jobs with family-supporting wages—often in the construction industry—found several steps critical to the success of cultural competency efforts:

- Leadership commitment and dedicated resources demonstrated the importance of cultural competency to employees.
- Cultural competence efforts must be a priority and should be tracked along with other management tasks.
- Training should be extended to front-line supervisors since they deal with diversity issues on a day-to-day basis.
- Employers reported they benefitted from cultural competency interventions even when they had not considered issues of race or ethnicity a problem.

Senior facilities officers should reach out to their HR departments for help identifying the cultural competency efforts that would help your organization.

Institutions should not just wait for the workforce to become more diverse; they should reach out to minority groups within the community and strive to attract a wide range of employees. Often recruitment efforts need to be combined with training programs to ensure workers have the right mix of skills. Individual colleges and universities rarely have the resources or the level of demand to warrant creating such programs themselves, so it makes sense to seek out existing programs or team with other employers in your area. Such programs have had significant results in some cities. For example, in 2010 the Tri-County Construction Labor-Management Council (TRICON), based in Peoria, convened a Labor Shortage Taskforce including industry representatives, education leaders and community members with the goal of building a diverse and skilled construction workforce. Programs underway include outreach to area middle and high schools to educate students on careers in construction, Women in Construction Days (a program targeted at high-school girls), a new construction pre-apprenticeship program coordinated by the Illinois Central College Professional Development Institute, and expanded training in green building. It is too early to know the long-term results of the TRICON program, but it holds

promise to increase not only the available workforce but also the diversity of that workforce.

**Questions for institutional dialogue:**

- What demographic shifts are expected in our region?
- Does our current workforce reflect the community in which we operate?
- How can we promote cultural competencies within our organization? What are the current attitudes toward race, ethnicity and culture? Who can help us become a more culturally aware and accepting workforce?
- How diverse is our current employee candidate pool? How can we increase the diversity of that pool?
- Can we partner with others in our community to create new recruitment and training programs? What can we do to promote careers in the industry?

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**7. Increase the flexibility of the workplace.**

**The issue:** Higher education HR policies and procedures need to become more flexible to adjust to a changing workforce.

**Strategies:**

- Make the case for flexibility to key stakeholders and build alliances.
- Understand the barriers standing in the way of more flexible policies and practices.
- Take stock of what you can control and strive to increase flexibility within the existing system.

As well as becoming more racially, ethnically and culturally diverse, the campus workforce will also include more women, grow older, and face increased competition for skilled workers. The one solution that can help address all of these problems is more flexibility in the policies and procedures of the workplace.

The rigid structure that has worked for decades in the workplace no longer serves the institution, and the problem may only get worse. For example, women are statistically more likely to be responsible for the care of both children and aging parents. More flexible hours and an emphasis on productivity over the number of hours spent on the job appeal to women workers with these needs. Older employees might not want to continue as

permanent employees but may want to work part-time. By accepting part-time or flexible work schedules, these employees can continue to provide their invaluable wisdom. Also, potential employees in highly competitive trades will soon be able to pick and choose where they work. More flexibility in terms, salaries, and advancement opportunities will help the institution attract critical staff.

The first steps for leadership in increasing the flexibility of the workplace are to make their issues known and to build alliances. Some campus leaders may have no idea of the looming shortage of skilled trade workers and would be surprised to learn that plumbers and electricians will soon be in short supply. Even HR experts may not appreciate the depth of the challenges. Presenting basic facts may go a long way toward enlightening key stakeholders. Academic leaders need allies across the campus if they intend to change hiring and workforce practices, so it is important to look for ways to make connections and build relationships.

Numerous barriers stand in the way of increasing flexibility, and a critical step is to evaluate the barriers on your campus. These might include state mandates for public schools, union rules for unionized campuses, and entrenched policies at larger institutions. Once you understand the rules and roadblocks, you can act constructively.

While working to overcome these barriers, you can make the most of the tools already at your disposal. Many aspects of workforce planning and management are under the control of the senior facilities officer. Look at ways to increase flexibility within the existing framework. At the least, you can strive for diversity in hiring, create mentoring programs, work to capture institutional wisdom from aging workers and promote a culture of accountability.

**Questions for institutional dialogue:**

- Do we understand the pressures that will challenge our workforce in the next five, ten and fifteen years? What issues will be critical—more women in the workplace? Aging and retiring staff? Increased competition for skilled workers?
- Do others on campus understand these challenges? What can we do to increase awareness about the challenges?

- Which critical stakeholders should be involved in efforts to increase flexibility? How can we build alliances with the right people?
- What barriers stand in the way of increased flexibility? Which barriers can be removed relatively easily? Which must be worked around?
- What do we want in terms of flexibility? What sorts of policies and practices would benefit the facilities workforce?
- What factors are within our control to improve workforce conditions right now?

## 8. Make smart decisions about outsourcing.

**The issue:** Outsourcing will increasingly become an important tool for accomplishing necessary tasks, but the right balance needs to be achieved between services outsourced to vendors and those kept the sole responsibility of employees.

### Strategies:

- Consider why the institution wants to increase outsourcing.
- Understand the barriers to and arguments against outsourcing.
- Develop an evaluation process that takes into account the values, mission and goals of your institution.

Most colleges and universities have already discovered the benefits of outsourcing at least some services—one survey found 95 percent of institutions outsource some non-academic services. When budgets are tight and competition for skilled workers is fierce, sometimes the right solution is to turn to vendors to get the job done. However, not every task should be outsourced, and institutions need to develop systems to assess what should and should not be trusted to others.

Today, the most common outsourced services include food services, vending, bookstore operations, copy services and custodial services. However, this list is growing. IT outsourcing is becoming increasingly common, as discussed in previous sections of this report; for example, hundreds of colleges and universities have outsourced their e-mail to Google. Institutions are also exploring outsourcing other services including finance and accounting, student services and financial aid. Numerous

services within facilities departments are also being outsourced, including groundskeeping, HVAC maintenance and elevator service.

A report by the Lumina Foundation for Education found four reasons colleges and universities turn to outsourcing:

- **Reduction in costs.** This is the most often cited reason for outsourcing and usually the most important. Vendors can use technology, economies of scale, and expertise to get jobs done more cheaply than the institution could do itself.
- **Reallocation of capital resources.** By outsourcing services, institutions eliminate the need for capital investments related to those services. For example, when Google handles your e-mail, it is Google's job to invest in new servers.
- **Improvements in quality.** Dedicated vendors offer the advantage of experience and expertise. Outsourcing allows institutions to focus on what they do best—education—and lets vendors do what they do best, whether that is food service, grounds maintenance or custodial services.
- **Reduction in long-term employment costs.** Savings from eliminated or frozen positions can be significant, in both the short and long term. And for highly competitive jobs, vendors can sometimes attract staff that the institution cannot.

Nevertheless, it is important to understand factors that might limit institutions' power to outsource. These can include existing labor agreements, non-union labor issues, concerns about quality, interest in maintaining control over key functions, concerns about cost savings, and political opposition. Even some of the advantages of outsourcing can be points of contention. For example, outsourcing can reduce long-term employment costs, but that may mean laying off staff who might have worked at the institution for years. A study by the Institute for Higher Education Policy found that the prospect of displacing or replacing employees made outsourcing a particularly difficult decision. A related concern was a loss of identity and community and the impersonal nature of outsourcing. It is different to have an unknown

vendor representative fix your elevator instead of a staff member whom everyone knows.

Not every task is appropriate for outsourcing, and what works for one campus might not work for the next. Large campuses have economies of scale that small campuses do not; private institutions have flexibility in purchasing that public colleges do not. In a report for higher education vendor Aramark, Joseph G. Burke, president of Keuka College in New York, suggested a framework for decision making that included asking strategic questions about an organization, evaluating the role of stakeholders in the outsourcing decision, identifying decision criteria and performing a cost-benefit analysis. Possible decision criteria include the following:

- Effect on educational quality (instruction and learning).
- Effect on students (and, consequently, admissions and retention).
- Effect on faculty and staff.
- Effect on annual budget and long-term cost projections.
- Effect on relationship with local community.

The key for each institution is to develop its own criteria that take into account the priorities and needs of the organization. Outsourcing is a powerful tool for cost savings and service improvement, but it is not a magic bullet.

#### Questions for institutional dialogue:

- What forces are driving us to outsourcing? What do we hope to achieve (cost savings, improved services, or other goals)?
- What roadblocks would get in the way of outsourcing? Are these barriers insurmountable or could they be overcome?
- What factors should be considered as part of the decision-making process? How do we rank these factors?
- Who are the major stakeholders in the decision?
- What are the long-term implications of outsourcing? What is the cost-benefit analysis? How will students, faculty and the campus community be affected?

## 9. Improve emergency preparedness.

**The issue:** Colleges and universities must take ongoing action to prepare the institution for a growing list of threats.

### Data Point: Outsourcing instruction *Institutions look to vendors to develop courses, teach students and grade papers*

Outsourcing in higher education has traditionally been limited to business operations that could be considered ancillary to the institution's mission. However, in a small but growing trend, some colleges and universities are outsourcing instruction as well.

The advantages are clear. Vendors can create online and specialized degree programs quickly and cheaply. Institutions can expand their markets, meet capacity issues and shorten the time to a degree. Outsourcing even allows colleges and universities to offer otherwise cost-prohibitive services such as 24-hour-a-day tutoring and detailed feedback on writing assignments.

However, many critics are appalled by what they see as higher education farming out its essential function. They argue that the profit motive driving private vendors is at odds with academic culture and that outsourcing devalues education. While outsourcing is often presented as saving institutions money, some outsourced courses cost more than traditional ones, raising questions of equity. And quality is hard to control. The future of outsourced instruction remains unclear and many battles over its adoption are yet to be fought.

—Alene Russell, *“Outsourcing Instruction: Issues for Public Colleges and Universities,” Higher Education Policy Brief, American Association of State Colleges and Universities, July 2010.*

#### Strategies:

- Make emergency preparedness an ongoing priority.
- Understand the elements of your campus emergency operations plan and particularly the role of facilities within that plan.
- Consider measures to mitigate risks such as security audits.
- Evaluate the need for backup power systems for key buildings and operations.

Colleges and universities take seriously their responsibility to protect students, faculty, and staff from criminal danger and natural disasters, but no other type of organization has such a challenge doing so. Campuses often cover large geographic areas that cannot be locked down. They include many different types of buildings and operations, from hospitals to residence halls, theaters to high-tech research complexes. The campus population varies day to day, hour to hour, month to month. It is an overwhelming task.

Nevertheless, campuses have poured time and money into creating emergency response plans designed to address threats ranging from terrorism to pandemics, hurricanes to sex crimes. They have mitigated risks, implemented notification systems, and established protocols. The temptation to relax a bit and concentrate on other priorities must be strong, but no institution can ever file away its response plan and assume the campus is ready for any eventuality. The new reality is that colleges and universities must continuously assess and refine their emergency preparations. The threat is simply too great.

Fortunately, a growing body of knowledge is available to help institutions improve their emergency preparedness. Researchers have closely examined campus incidents and discovered common themes and issues. For example, the Federal Emergency Management Agency (FEMA) makes the following recommendations based on the study of previous emergencies:

- Integrate comprehensive, all-hazards emergency management planning into overall local and state planning.
- Institute regular practice of emergency management response plans and revise them as issues arise and circumstances change.
- Clarify command structures within the institution and with local and state agencies.
- Coordinate with surrounding jurisdictions and response and support agencies to develop plans for shelter and mass care.

Emergency plans should include a few key components. One is a communication plan that identifies the network of personnel who should be involved in communications decision making; hasty, incoherent and contradictory information creates chaos and complicates response efforts. Another is an assessment of campus

resources available in a crisis, including facilities that can accommodate information centers or shelters and human resources such as police officers, medical professionals, mental health counselors and spiritual leaders. At the heart of emergency preparedness is the emergency operations plan that sets out the steps to be followed in a crisis. Many plans today incorporate the well-defined and field-tested Incident Command System, a standardized, on-scene management approach that allows for the integration of facilities, personnel, procedures and communications within an organizational structure; enables a coordinated response among various jurisdictions and functional agencies; and establishes common processes for planning and managing resources.

Senior facilities officers play an important role in emergency preparation. One important task the facilities department can perform is to conduct building security audits to assess the risks to different facilities and their operations. Audits take an overall look at a building, its users and uses, where it is vulnerable and how it might be made more secure. Different types of buildings will require different responses. For example, a residence hall faces different threats and needs different interventions than a research lab would require.

Utilities are another major area of responsibility for facilities professionals. Natural disasters can wipe out electrical power, damage communications systems, interrupt water supplies and cause natural gas leaks. Utility damage assessment and repair should be included in every emergency operations plan, and facilities staff should understand their role in a crisis. During the planning process, institutions should evaluate the need for redundant or uninterruptable power supplies for critical facilities such as hospitals, command centers, data centers and research facilities, especially those that house animals.

#### Questions for institutional dialogue:

- What are the threats that confront the campus?
- Is there an emergency operations plan in place? How often is it reviewed and updated?
- How are campus leaders trained in the use of the plan? How often do they practice emergency response procedures? Is there a system in place for gathering feedback from practice sessions and incorporating it into the plan?

- Has the institution coordinated with local and regional authorities on the plan? Are lines of communication and command clear? Have plans been established to provide shelter and aid in a mass emergency?
- Are facilities professionals involved in the creation of the emergency plan? What is the role of facilities in a crisis?
- Has the institution completed security audits on campus facilities? Which buildings are most at risk and how can that risk be mitigated?
- Which facilities and operations would be endangered by interruptions to utilities in general and power supply in particular? Do we have backup or redundant systems in place where we need them?

## 10. Manage the existing built environment.

**The issue:** Senior facilities officers must take steps to ensure the existing campus buildings and infrastructure can meet the expected needs of the institution.

### Strategies:

- Understand where you are today and how well the campus is meeting current needs.
- Look to your institution's mission and vision for a sense of where the college or university is going, then assess what will be needed to make that vision a reality.
- Keep up with trends and issues in higher education and evaluate how those trends will shape facilities.
- Craft a vision not only of the future campus but also of the future facilities team.

Spend time with IT experts for awhile and you will hear a term keep popping up: future proof. To “future proof” a system means creating a computer or server or database that will remain useful and accessible for years to come. It might mean buying more data storage than you need right now in anticipation of using it down the line, or storing data in a format that seems most likely to be still in use for a decade or more.

It is challenging but not overwhelmingly difficult to future proof new buildings on campus. Architects and engineers do it all the time—they go to a great deal of effort to understand not just the current needs the

building is intended to fulfill but also the anticipated shifts in pedagogy, technology, and research. But future proofing the entire campus, is another story. The average college or university includes buildings and systems built over decades, even centuries. A residence hall from the 1930s is next to a classroom building from the 1950s and a student union from the 1980s. Each was built to different standards using different technology and was intended to meet different needs. Renovations over the years might have helped—or they might have made the situation all the more complicated.

So how do you future proof your campus? Particularly, how do you future proof your campus in this era of slashed budgets, hiring freezes, and competing priorities? Obviously you cannot tear it all down and build it afresh employing the newest, greatest, greenest, most adaptable, most IT-friendly strategies. You have to take on the challenge step by step, and most of the time future proofing will not be your first priority. Instead it should be a guiding principle that shapes the choices you make on each and every renovation and update.

The first step is to understand where you are today. How well is the existing built environment meeting current needs? You can make this evaluation using a number of tools including a facilities inventory, condition assessment, space utilization reports, and inspections. A gap analysis can also be useful; it helps organizations compare actual performance with potential performance and focuses on two questions: “Where are we?” and “Where do we want to be?” A facilities gap analysis can expose areas in which facilities are failing to meet their potential to serve the campus community.

The next step is to consider the future demands on the built environment. Predicting the future is a risky business, but it can start on a firm footing by looking at the conception the institution has of its own future. What is the mission and vision of the institution? Do current facilities line up with those concepts? If your college or university sees itself primarily as a residential campus that will provide a 24/7 learning experience for students, yet you only have residence hall capacity for a quarter of students, it makes sense to plan additions or renovations to expand the number of dormitories. If your institution wants to build on its reputation of cutting-edge research yet your lab facilities are outdated, it's time to start budgeting for lab renovations.



Other future demands can be reasonably interpreted from established trends. Tools such as this document and similar reports from other higher education associations and organizations regularly report on trends. Some things we know. Energy will grow more costly. The student population will become more diverse. Technology will become ever-more pervasive. Online learning will expand. Sustainability will increase in importance. Determining how these trends will shape your campus is more difficult and requires a greater leap of imagination. It helps to get a diverse group of campus leaders together to discuss these issues. It is important to draw upon the wisdom of faculty, administrators, staff, and students in a wide range of functions—librarians will have a different perspective than student services, but all leaders should be taken into account when envisioning future needs.

Once you have a sense of where your campus is going, you need to see what it will take to get there. Take a look at your current resources including budget and staff. If you project forward ten, fifteen or twenty years, will these resources be adequate? What needs would be unmet? What services will become irrelevant? You need a vision not only of the future campus but also of your future workforce. How can you start planning now to have that team in place when you'll need it?

Future proofing is an imperfect science, but it's not just crystal-ball gazing. By building on what you know now, you can shape a reasonable response that will better prepare your campus for what is to come.

#### Questions for institutional dialogue:

- Where is the campus today? Do we know the condition of our buildings and systems?
- How well are current buildings, systems and infrastructure meeting current needs? Where are the gaps between where we are and where we want to be?
- What is the institution's vision for its future? What are the facilities implications of that vision? How will the built environment need to change to fulfill that vision?
- What trends will shape the campus? How will trends such as energy cost increases, student diversity, changing technology and sustainability affect this institution? How will facilities need to respond?
- What resources will be required to create and maintain the future campus? What should the facilities staff and budget look like in ten, fifteen or twenty years? How can we move from where we are to where we need to be?