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CIOs Talk about Budgets: Emerging Stronger and Leaner

To explore current and future implications of the economic downturn on IT organizations and higher education institutions, *EDUCAUSE Review* assembled a panel of five senior IT leaders:

- Bruce Maas, CIO, University of Wisconsin–Milwaukee
- Fredrick Miller, CIO, Furman University
- Pattie Orr, Vice President for IT and Dean of University Libraries, Baylor University
- Julie Ouska, CIO and Vice President of Information Technologies, Colorado Community College System
- Shelton M. Waggener, Associate Vice Chancellor and CIO, University of California, Berkeley

On the following pages, these leaders answer questions—compiled by Philip J. Goldstein—regarding their IT budgets, possible structural changes and cost models, and the opportunities and challenges that lie ahead.



Bruce Maas

CIO

University of Wisconsin–Milwaukee

1. How has the economic downturn affected your institution's IT budget? What measures are you implementing, or planning to implement, to address any cuts in your IT funding?

UW–Milwaukee is one of two public doctoral institutions in the state of Wisconsin. We have over 29,000 students and approximately 3,500 faculty and staff. Since 2003, we have been planning for and implementing a carefully considered enterprise approach to IT services, focusing on institutional requirements and the reduction/elimination of service redundancies. All areas of the University of Wisconsin–Milwaukee were asked to plan for a budget cut of up to 10 percent. Using a set of publicly vetted IT guiding principles as a foundation, we are addressing some of our one-time cuts by contracting some of our application developers to University of Wisconsin System projects, resulting in cost savings to the system (since outside consultants would cost more) and providing revenue back to our institution. We are contracting 2.5 FTEs for two years as a pilot effort. We are slowing down the pace of new development to compensate. This is a classic win-win.

We also closed down one general-access student computer lab after carefully reviewing usage patterns and determining that sufficient capacity remained, and we are investigating the impact of transitioning most of the remaining labs to self-service (unstaffed) operation. We believe the service-level drop will be acceptable to the campus community given the cost savings and also given the alternatives (i.e., the loss of services considered as part of other reductions). In addition, we are

strategically strengthening computing operations because of increased reliance on core technology services, in part due to budget reductions related to local IT services. Over the last few years, local units have increasingly leveraged core services when appropriate and have focused their resources on specialized local needs.

2. Assuming the downturn is deep and lasting, what long-term structural changes in how institutions manage technology and technology services do you think need to be considered?

We started by working with campus shared governance to develop a set of IT budget guiding principles that complemented overall campus guiding principles. The intent was to create a unified campus approach that did not result in problems being shifted between organizational units. Six years ago, our institution began its Wise Use of Technology Initiative, in which we address institutional business requirements and select core enterprise approaches whenever scaling (leverage) is an option. We are now focusing on central and distributed IT staff working together more effectively in what we call “service layers.” Each layer has both core and edge services. Over the long term, we need more role clarity and agreement in order to understand—as Brad Wheeler noted in “Research Technologies: Edge, Leverage, and Trust” in *EDUCAUSE Review* (<http://www.educause.edu/library/ERM0761>)—what should be leveraged by a central provider and what should be provided at the edge close to end-users. In addition, I believe the CBO-CIO relationship needs to be strengthened, resulting in best budgeting practices for information technology, joint efforts to address business process improvement practices, and more focus on coordinated strategies that support the campus mission and vision.

3. It has been said that every crisis is also an opportunity—in this case, an opportunity to achieve necessary reforms that otherwise would not be politically or culturally feasible. What opportunities should IT leaders be sure not to waste in this crisis?

A crisis often brings clarity of thought not achievable in less stressful times. This

is the time to press the hard decisions about choices, because there is greater awareness today of the tradeoffs that are possible. Getting to the key issues related to leveraged services and edge services has been difficult until now. Lately, I have found a greater receptiveness to ideas promoted in a way that does not marginalize any service providers but still challenges their assumptions. My suggestions of selective reductions or eliminations of services have been considered as viable options rather than as insensitive or obstructionist views. I'm finding it easier to engage discussions on prioritization and the long-term implications of decisions. I believe this crisis has helped our campus community to realize that technology has strategic importance, in particular that it can be a means to utilize human and other resources more effectively.

Likewise, we have been able to have better conversations about ways of working together more effectively. One example of a strategic initiative that is showing tremendous potential is our enterprise approach to calendaring with Zimbra. This fall, we will be deploying a public calendar-subscription center, which will permit student, business, and academic units to publish calendars and will allow students, faculty, staff, parents, and the broader outside community to access our calendars easily. In effect, we will be presenting a practical way for our community to stay informed and to better organize their academic, social, student life, and private interests—all through mechanisms that create higher levels of efficiency. We continue to believe that offering more effective means for our incoming freshmen to be organized from the moment they arrive on campus will lead to increased retention, which is one of our strategic goals. Change is often disruptive, and the fiscal crisis provided us with the nudge we needed to move this initiative forward.

4. Should technology be used by institutions to more radically alter the cost model of education? If so, how? Do you feel that institutions are ready to leverage technology in these ways?

I believe institutions need to understand and agree on their own requirements,

based on their unique circumstances, including institutional culture and mission. I am therefore reluctant to make any sweeping generalizations. For our campus, hybrid or blended courses have been developed and deployed successfully and, in some cases, with very encouraging improvements in learning outcomes. We continue to engage actively in initiatives such as a Sloan Foundation grant to pursue innovations and measurable outcomes. We also have had success with fully online courses and with entire online degree programs, such as our Ph.D. in nursing (<http://www4.uwm.edu/nursing/graduate/doctoral/online/>). Our Learning Technology Center staff have been active in collaborating with other institutions and in making presentations to help advance the national dialogue. We continue to seek to understand what is working effectively and what isn't and to strengthen the relationship between instructional design staffing levels and needs of the faculty. To achieve a high-quality outcome, we need to invest in people with the right skills, in addition to software and hardware.

5. What is the biggest challenge you've had to face so far in the economic downturn? What do you think will be the biggest challenge still to come for your IT department, for your institution, and/or for higher education?

It has become increasingly difficult to keep the "lights on" over the last six years, after suffering IT budget reductions in 2003–5 and then experiencing greatly expanding enterprise services and reliance on information technology for core campus business. The biggest challenge so far has been the discussion about how service levels compare to budgeting or investment levels. With constrained resources come choices and the need for prioritization. Four years ago, Sallie Ives and Karin Steinbrenner quoted in "Bridging the Divide," an *ECAR Research Bulletin* (<http://net.educause.edu/ir/library/pdf/ERB0509.pdf>): "Academe is fluid, nonstandardized, seemingly unfocused in the pursuit of knowledge using shared governance to arrive at decisions. In contrast, technology requires standards, conformity, predictability, control, and calls for fast

decision making." They concluded: "No wonder these two worlds . . . struggle to communicate." This quote has been posted on the wall of our IT organization's conference room since 2005, and we use it as a reminder of the challenges we face. If we can learn how to have consistent, respectful, informed dialogue on our campuses about information technology—IT priorities, IT expectations, and IT service levels—we will emerge stronger, leaner, and healthier after this economic downturn.



Fredrick Miller
CIO
Furman University

1. How has the economic downturn affected your institution's IT budget? What measures are you implementing, or planning to implement, to address any cuts in your IT funding?

Furman University has asked all departments to cut 6 percent from discretionary budgets for the 2008–9 year and another 6 percent in 2009–10. (At Furman, a "discretionary budget" is any account except salaries, wages, benefits, and accounts used for multiyear contracts.) In addition, all members of the President's Council have been asked to come up with additional savings for the 2010–11 fiscal year. The IT organization is taking extraordinary measures to address the university's budget needs. So far we've been able to identify more than \$450,000 in IT savings over the next two years—all without cutting any staff positions. These savings will come from a variety of sources:

- Eliminating "frills" (e.g., a Furman technology desk calendar)

- Reducing hardware and software maintenance
- Switching to lower-cost vendors when possible
- Reducing the number of institutional local phone lines
- Establishing print quotas for free printing by students
- Replacing university-owned cell phones with subsidies for personal cell phone use for university business
- Searching for process and system changes that will save money
- Increasing the planned life-cycle for most university-owned computers from three to four years
- Completing a virtual server initiative that will save both in server replacement and in electricity costs
- Making greater use of low-cost cloud computing and open-source solutions
- Putting a number of technology initiatives on hold until funding becomes available
- Looking for new collaboration/consortium opportunities that may help us stretch our funding dollars

I've explored our budget plans and activities in more detail in the *EQ* article "Rationalizing IT Rationing: Ten Ways to Cut the IT Budget (and What Not to Cut)" (*EQ*, vol. 32, no. 2, 2009).

2. Assuming the downturn is deep and lasting, what long-term structural changes in how institutions manage technology and technology services do you think need to be considered?

Let me start by noting that whether or not the downturn is deep and lasting, one thing will not change: the academic mission comes first. The people who manage information technology must work with the campus community to determine how technology can best serve the academic mission. I hope that institutional recognition of the importance of IT governance will be a long-term structural change.

At Furman, various technology advisory committees have helped us address the downturn by (1) advising on how best to reduce the impact of budget cuts on the academic mission; (2) providing a forum for discussing technology changes to

improve the efficiency and effectiveness of the university; and (3) communicating to our various constituencies why the university is making changes. One conversation we're having more often within our IT organization, and with our advisory committees, involves the concept of "right sourcing." What is the right source for an information solution for our institution? When should we deliver a service in-house rather than out-source the service? When is it better to use an open-source solution? If we do consider a "cloud computing" solution, how will it integrate with our existing campus information architecture? If we keep a service in-house, will support be centralized or distributed? What are the privacy, security, and legal considerations? How will such decisions affect the academic mission? Certainly, I expect such conversations to continue beyond the downturn. How we deliver services in the future may be profoundly altered by the choices we make today.

3. It has been said that every crisis is also an opportunity—in this case, an opportunity to achieve necessary reforms that otherwise would not be politically or culturally feasible. What opportunities should IT leaders be sure not to waste in this crisis?

Two opportunities come to mind: one within and one outside our IT organization. Within our technology organization, the downturn has caused us to look more closely at best practices for information service management. We're reviewing our services using the ITIL (IT Infrastructure Library) framework to assess whether we're following proven best practices, and we're searching for new service models that may become best practices. However, getting IT professionals to step back and look at what they've been doing, and to explain why they've been doing whatever they've been doing, can be a difficult task, especially when project deadlines and service demands are pressing. Postponing a number of initiatives due to funding concerns has opened the door for us to re-examine the work we are doing.

Outside our IT organization, we've begun to meet with departments that

have their own IT resources. We're bringing up the centralized-vs.-decentralized debate. Our main focus now is to convince departments that we can provide better, more secure, centralized service for department servers by hosting those servers in our data center. We're looking at whether the number of department computer labs is appropriate, and we're examining our software license requirements. In the future, we hope to extend this conversation by looking at the university's distributed technology support personnel. The topic of human resource allocation is particularly difficult given the political and cultural history of such decisions, but with the current financial uncertainty, now is the right time for those conversations.

4. Should technology be used by institutions to more radically alter the cost model of education? If so, how? Do you feel that institutions are ready to leverage technology in these ways?

The answer here depends on the institution's mission and on what is considered "radical." Most of my experience has been at liberal arts institutions, and some of the radical ideas I've heard seem antithetical to the mission of a liberal arts institution. Is using technology merely to increase the number of students that can be taught within a class really the best way to improve student learning? I believe technology can be an enabler for a problem-solving, project-oriented, experience-based approach to education. IT support provides some explicit benefits for teaching and learning, whereas other benefits arise tacitly as students and faculty acquire knowledge as a result of their membership in a community that uses technology to live the ideals and values of the institution.

Questions that come to mind when thinking about using technology to alter the cost model include the following:

- How can technology more effectively engage students and faculty in teaching, learning, and research?
- How can technology better stimulate collaboration across academic disci-

plines, as well as promote discussion of values, ethics, personal responsibility, and critical thinking?

- Are our current administrative systems the best model for delivering cost-effective service, or should we re-examine the entire paradigm?
- What assessment methods are most effective for letting us know which technology tools work best with our varied pedagogies?

If these are radical proposals for altering the cost model of education, then I'm all for being radical.

5. What is the biggest challenge you've had to face so far in the economic downturn? What do you think will be the biggest challenge still to come for your IT department, for your institution, and/or for higher education?

I started in my current position at Furman University on September 15, 2008—the day Lehman Brothers declared bankruptcy. I've been learning how Furman operates while at the same time assessing its operations and its strategic direction. We've had to make some changes in our strategic direction on the fly. What has impressed me most has been the willingness on the part of everyone here—including staff, faculty, students, and board members—to listen and to try to understand how we can work together to find the best solution to our financial challenges.

I expect the challenges are similar across higher education: adjusting to decreased endowment, enrollment, and gifts and demonstrating that what we're doing in the IT organization and in the institution is adding value to higher education and to society. I believe our biggest collective challenge will be to build a culture of assessment. I'm not talking about satisfaction surveys but rather about demonstrable, evidence-based results that show our efforts justify the costs. We can't just purchase technology based on the hope that it will make education better. We need to develop and implement IT best practices that will help our institutions justify *their* costs as they work toward their teaching, learning, and research missions.



Pattie Orr
Vice President for IT and Dean of
University Libraries
Baylor University

1. How has the economic downturn affected your institution's IT budget? What measures are you implementing, or planning to implement, to address any cuts in your IT funding?

At Baylor University, we have been fortunate in that we have not experienced drastic reductions this year and we expect to experience level funding in the budget for the upcoming fiscal year. As soon as we knew the economy was beginning to experience issues, I asked each of my directors to begin to construct scenarios to help us consider what we might need to do if Baylor was affected. I asked them to gather budget data from the current year and to begin to think how they would react if we needed to take a cut in our Information Technology Services (ITS) budget. Additionally, we talked through Philip J. Goldstein's EDUCAUSE white paper *Managing the Funding Gap: How Today's Economic Downturn Is Impacting IT Leaders and Their Organizations* (<http://net.educause.edu/ir/library/pdf/PUB9004.pdf>) to help us identify methods that others were using to plan reductions and set guiding principles.

We are gathering data and evaluating our services in preparation for changes that may be required. Normally, we use end-of-year reserves for new initiatives and to fund additional positions. This year, we are being much more conservative about discretionary spending. We have been visiting with leaders from the various constituencies and engaging both our student advisory committee and our Library/ITS Advisory Council to help us think through a variety of needs and strategies.

The following activities are presently under way:

- We are moving forward quickly with the virtualization of servers, saving us money on hardware and staff time. We are also saving significantly in energy costs through virtualization.
- We have secured supplemental funds to reconfigure some of our software licensing to provide site licensing (often more cost-efficient in the long term), since it is sometimes wiser to spend additional money in the short term, even in a financial crunch. Thinking in innovative ways is essential to managing well in difficult financial times.
- We have been talking with vendors that we think might be able to provide hosted services for us in the future.

2. Assuming the downturn is deep and lasting, what long-term structural changes in how institutions manage technology and technology services do you think need to be considered?

At Baylor, the IT organization and the libraries are organized in one division, under one executive leader. This strategy allows us to look at ways in which we can work effectively with all of our information resources and technology in order to be the best stewards of our resources. For institutions that are not structured in this way, I believe it is essential to develop a strategic partnership between the IT leaders and the library leaders. Helping the campus community to see that the two areas are working together and are not duplicating services may enable a better defense of budget needs.

In addition, we need to try to rebalance the distributed academic and administrative IT services. Now may be a good time for encouraging shared services, such as moving support for servers to the data center to reduce costs for environmental (HVAC, UPS, etc.). Offering opportunities for shared services with ITS can help deans and department heads stretch limited staffing in the various divisions. Virtualized servers can be offered for less cost to academic and administrative units. Providing cost-effective data storage may reduce the need for expanding or upgrading distributed data centers.

We should look carefully at every service and gather data to see how reductions can be made:

- Evaluate services to see if they should be retired or outsourced.
- Look at contracts to see how we might renegotiate, streamline, and standardize.
- Consider how we might collaborate among departments, campus schools/colleges, and other higher education institutions to reduce costs.
- Analyze the cost savings that might come from outsourcing services.
- Look more carefully at vendor partnerships.
- Consider grants and foundation gifts that might be available to help with teaching and learning projects.
- Rethink how student employees or temporary employees might supplement the ITS workforce if funding for new positions is not available.

Enforcing standards can be difficult in large and diverse higher education institutions. That being said, the current financial difficulties may be a good time to see if there are areas where the number of supported products can be reduced. Combining software contracts for more economical site licenses or perpetual licenses may benefit the institution. Simplifying the ordering for computers and other IT equipment could save money and time while streamlining standards. There are many ways to streamline and centralize, but some of the long-term answers will most likely involve outsourcing.

3. It has been said that every crisis is also an opportunity—in this case, an opportunity to achieve necessary reforms that otherwise would not be politically or culturally feasible. What opportunities should IT leaders be sure not to waste in this crisis?

This crisis is an opportunity to engage our colleagues in both administrative and academic areas to make the most of the resources for our institutions. It is a chance for the CIO to forge a strategic partnership with the CFO. It is a reason to engage all constituents in dialogue and to get help in prioritizing the importance of

our services. Now may be the time to relax some of our rigid policies that prevent innovation and outsourcing. Perhaps we can finally “stop” doing something.

In good financial times, no one would want to discuss reducing anything that might affect his or her area. In difficult times, we need innovative leadership to see how shared services, standardizing, streamlining, creative licensing, and outsourcing can be employed. No one will want to work with ITS on this if we offer substandard services. We need to provide excellent services and partnerships that will truly benefit our colleagues. If we can't do that, we need to look for ways to outsource or work collaboratively to provide the best services possible.

Typically, ITS organizations do not have effective advisory groups. Since information technology is expensive, we must create strong advisory groups and invite faculty, staff, and students into our discussions to help our institutions manage the funding gap. Advisory groups can help us get the best thinking for moving forward and can also be strong partners to help us explain difficult decisions or cuts.

To move forward, we need reliable information on our services. Decisions need to be driven by data. This is a good time to analyze our services and the needs of our constituents in order to make effective decisions. EDUCAUSE and the EDUCAUSE Center for Applied Research (ECAR) can be invaluable partners in helping campuses to gather information and identify trends.

4. Should technology be used by institutions to more radically alter the cost model of education? If so, how? Do you feel that institutions are ready to leverage technology in these ways?

There is no doubt that as the economy struggles, the importance of reducing the cost of higher education will rise. More than ever, we need to conduct long-term planning and create three-to-five-year roadmaps of where we are going with information technology. These plans will require continual refinement, but in difficult economic times, we cannot afford a “surprise” for the budget. Long-term plans can help us identify areas for collabora-

tion or shared services and can allow us to truly measure the benefit of outsourcing. I believe IT professionals have the best vantage point for creative thinking on reducing costs because they work with virtually every other area on campus. That being said, time will tell if IT leaders can leverage their relationships and manage their often rigid, centralized IT approaches in ways that are truly innovative and effective.

5. What is the biggest challenge you've had to face so far in the economic downturn? What do you think will be the biggest challenge still to come for your IT department, for your institution, and/or for higher education?

Our biggest challenge so far has been fear and rigid thinking. I believe the biggest challenge at Baylor University for the future will be to gain the support of colleagues across the institution to work together to make difficult choices—choices that are holistic and the best overall for Baylor.



Julie Ouska
CIO and Vice President of Information Technologies
Colorado Community College System

1. How has the economic downturn affected your institution's IT budget? What measures are you implementing, or planning to implement, to address any cuts in your IT funding?

Although we don't know the full extent of budget cuts at the Colorado Community College System for the coming year, we are reviewing budgets very thoroughly and are expecting a flat budget at best. Some budgets will be affected less, some more. We have identified all of our contractual maintenance agreement increases, since accommodating those leaves less discretionary

money. However, we are reviewing *all* of our maintenance budgets and are making sure we have the right level of maintenance for our hardware and software. Some positions have been frozen, although with appropriate justification, critical positions can still be filled. With every open position, we are looking at our structure and our way of delivering services to determine if we should consider alternatives or changes to our staffing, skills, or services. For any new projects or requests, we are completing return-on-investment analysis to determine if there are cost savings or improved business functionality as a result. Some projects are being deferred completely. We are also looking at how we charge back for some of our centralized services, such as the ERP, although charge-backs really just move the cost. Basically, we are trying to be smart about our IT investments and about the value and benefit that those investments bring to the system.

2. Assuming the downturn is deep and lasting, what long-term structural changes in how institutions manage technology and technology services do you think need to be considered?

We are looking, and will continue to look, at centralization vs. decentralization. We provide ERP and telecommunications services to the thirteen community colleges and are in the process of consolidating e-mail for all thirteen colleges as well. We are reviewing other services that might be reduced in cost if they are centralized or decentralized. Doing so is a little difficult, however, since some colleges aren't investing to the level they should be; thus, centralization may cost them money, even if it provides a more robust or stable environment. We are also looking at staffing, especially where we provide partial staffing to the colleges, and are investigating whether it is cost-effective to split one position between two very separate roles and responsibilities.

Structurally, we will continue to evaluate how technology is provided throughout the system office and to the colleges. We may need to decide whether there are services that we should no longer provide. For example, although our modem pools are long gone, we do continue to print centrally for many of the colleges—a service that may not be cost-effective. In conjunction with

business leaders, both at the system level and at the college level, we will focus on how to use our technology more effectively and on how to determine what can be standardized into repeatable processes to take advantage of automation and what requires a human customer-service touch. We would probably have done this regardless of the economy, but the current economic downturn lends a certain level of urgency to this effort.

3. It has been said that every crisis is also an opportunity—in this case, an opportunity to achieve necessary reforms that otherwise would not be politically or culturally feasible. What opportunities should IT leaders be sure not to waste in this crisis?

Business process improvement is a good opportunity for all institutions. We need to make sure that we are not continuing with outdated processes and ideas just because someone finds security in them. IBM used to have (maybe still does have?) a work-elimination goal. People were rewarded for eliminating unnecessary or redundant work. I think we should all be looking at redundancies right now. We need to review what we do and decide if we can do those things better in-house or “out of house” and which option is more cost-effective. Ownership of something can be more expensive. If someone else can do the function as well or with less risk, we have an obligation to review what we do and how we do it. We may have a misguided sense of how critical some systems are. Providing 7x24 response time is a lot more expensive than being available “during business hours.” Do we always need a 7x24 response or a 99.999 uptime? With some systems we might, but with others we might not. We also need to take the discussion out of information technology and ask our users and colleagues these same questions. How valuable is immediate response to you? With the current flat or declining budgets, an increase in the cost of IT maintenance may mean that someone—somewhere else—loses his or her job. We need to understand our place in the larger institution or system.

4. Should technology be used by institutions to more radically alter the cost model of

education? If so, how? Do you feel that institutions are ready to leverage technology in these ways?

I think technology already is being used to alter the cost model. At the Colorado Community College System, our greatest enrollment growth is in online and hybrid classes. As our students feel the need to reduce their costs, they look to online or hybrid classes, which result in fewer commuting, daycare, and other variable expenses. Adding sections online is also much less expensive for us than adding more buildings or classrooms. Some of the higher-cost programs, such as nursing and EMT, are doing more with simulation because of the expense of providing hands-on experience with live patients. Our students and customers will help drive the leveraging of technology in this fashion. We may not be as ready as we would like to be, but we will get over that.

5. What is the biggest challenge you've had to face so far in the economic downturn? What

do you think will be the biggest challenge still to come for your IT department, for your institution, and/or for higher education?

Aside from salaries, information technology is the largest single budget item for the Colorado Community College System office, so I have to be careful during budget discussions. Having the largest budget makes information technology a target for reduction because people don't understand that most of the IT budget is truly a fixed cost, not a variable or optional cost, and that the IT organization provides services to thirteen colleges, not just the system office. I have to make sure that I am speaking about information technology in a business and services-provided sense. My conversations about information technology need to be related to critical system activities, such as revenue generation through the collection of tuition or enrollment growth through the simplicity of registration or student satisfaction through the development of features that help colleges retain students.

I think our biggest challenge may be adapting to a new economy—one that is not so flush and that is scaled back. If this downturn truly represents a ratcheting-down of the economy and a resetting of our economic equilibrium, then we may have to change our services, our salaries, or our other cost factors to adapt. We may have to alter how we deliver courses, whether people like it or not. Online tends to be a choice and an option for students, but some programs may simply be more cost-effective in an online or hybrid mode. Since community colleges focus on providing career and technical education—on helping people to retool for new job markets or to develop skills that make them more employable or retainable—we may have to find more cost-effective ways of delivering that kind of education.

Since the demographics are also changing, I think higher education may be in a restructuring mode that will last longer than the current recession. With fewer college-age students in the coming years, colleges and universities will be in fierce competition for those students. Institutions may need to focus on older students or on career-enhancing education. Students may be more selective about the type of higher education they need. Do they need a degree, or do they simply need some business courses and a certification, especially if they are looking to the trades for employment? Since some professions now require master's degrees, students may be looking for more cost-effective ways to achieve those degrees—ways that don't require both a bachelor's and a masters' degree, along with the associated time and cost. Increasingly, high school and home-school students are completing their high school and some college/university credits simultaneously. How can higher education institutions support those students' needs, and what does doing so mean for curriculum and facilities? If students have a harder time obtaining credit and/or have less desire to get into debt, will they be demanding lower costs for, or more direct benefits from, higher education? Although there will probably always be a place for the expensive and exclusive colleges and universities, the rest of us may have some adjusting to do.



Shelton M. Waggener
Associate Vice Chancellor & CIO
University of California, Berkeley

1. How has the economic downturn affected your institution's IT budget? What measures are you implementing, or planning to implement, to address any cuts in your IT funding?

Like virtually every other public higher education institution in the United States, the University of California, Berkeley, is experiencing significant reductions in public funding and endowment earnings, affecting every area of the campus. Berkeley's IT budget is nearly \$140 million and is dominated by support for academic and research activities. Since demand in the research area continues to grow, cutting our investment there would be very difficult and strategically unwise. However, we do expect to work harder to find ways to leverage technology investment across research projects in order to get more benefit from each dollar spent.

In other areas, including administrative and public outreach activities, we are redoubling efforts to do more with less. We expect to see reductions in both central and departmental funding in the 12–15 percent range for fiscal year 2009–10. For smaller units, budget decreases in this range will be exceptionally difficult to achieve without service reductions or eliminations. At the central level, we are making some across-the-board cuts and programmatic reductions while simultaneously accelerating some technology transitions that will result in lower operating costs. However, most of these are multiyear activities, with savings to be realized in two to five years, so we continue to work on identifying short-term, temporary savings to bridge the gap.

2. Assuming the downturn is deep and lasting, what long-term structural changes in how institutions manage technology and technology services do you think need to be considered?

The proven cost-savings methods that have been applied in the private sector—centralization and standardization—have historically been minimally adopted within higher education because of the wide variation in needs and culture of decentralized decision-making. But in these times, we can no longer afford to be as autonomous as we have traditionally been. Areas that are true commodities—such as storage and backup services, e-mail, calendaring, and other collaboration tools—can generate significant savings in both time and money if standardized and provided at scale. In other areas, the real opportunity is in the adoption of shared services—that is, the use of applications delivered as a service over the web rather than locally developed and run solutions. This will create opportunities not just across a single campus but across multiple campuses and institutions. As an example, Berkeley recently developed a business continuity tool that has been downloaded for use by more than one hundred other colleges and universities. Rather than continuing the local development and ad hoc downloading of the software, we are moving toward a partnership with the Kualu Foundation (<http://www.kualu.org>) and are converting the software into a service to be hosted over the web for use by any higher education institution (<https://ucready-demo.berkeley.edu/login/login.cfm>). The economics are compelling, and the technology advances that allow people to purchase only what they use, instead of entire environments, the bulk of which may sit idle, must be explored more fully.

3. It has been said that every crisis is also an opportunity—in this case, an opportunity to achieve necessary reforms that otherwise would not be politically or culturally feasible. What opportunities should IT leaders be sure not to waste in this crisis?

I believe we are at a significant inflection point for information technology. The current economic crisis has arrived at a time when new modes and models of meeting

the demand for campus technology are emerging and, in some cases, already maturing. Five years ago, no campus would have contemplated using Google or Yahoo! or Microsoft as a hosted e-mail provider. Today a number of campuses have made that leap. Eighteen months ago, researchers would not have considered Amazon as a technology provider for scientific computing, but today thousands of hours and petabytes of storage are being consumed by researchers from Amazon's Elastic Compute Cloud (EC2) and Simple Storage Service (S3). The idea that campus researchers can use these services to meet their needs without the campus IT organization having to own and locally manage every piece of the technology stack is a concept whose time has come. I believe this current financial crisis will move all IT leaders to consider how we can operate as local cloud providers, working to integrate with commercial and community-source offerings to provide seamless services from many locations.

CIOs and IT leaders in higher education should seize this opportunity to strengthen the community by partnering on a new generation of shared services provided by, and shared between, campuses. Just as Internet2 did a decade ago in laying out a vision for high-performance networking for higher education, we have the opportunity to embrace new partnership and collaboration models that hold the promise not only of lower costs but also of improved services, faster delivery, and more rapid innovation. The opportunity is there; the only real question is whether we will seize it.

4. Should technology be used by institutions to more radically alter the cost model of education? If so, how? Do you feel that institutions are ready to leverage technology in these ways?

Although education is a very tradition-bound community, we are always evaluating new and innovative ways that technology can support the pedagogical needs of instructors and students. The real challenge isn't in identifying or adding new options; in fact, we have invested a considerable amount in technology, including course management systems, technology-enabled classrooms, podcasts, vodcasts, wikis, and so on. The real issue is the cost of maintain-

ing all of the previous models in addition to the funding required to explore and implement newer approaches. Even in situations where economies of scale can be achieved and productive gains are clear, faculty decisions on the adoption of the new in place of the traditional are generally cautious and (appropriately) not driven by financial considerations. To truly change cost models, we need to think about technology as being not simply additive but, instead, transformational. Simply put, we need to learn how to *stop* doing things.

I believe technology does offer real opportunities to fundamentally change some aspects of our institutions in very positive ways. The most significant of these are in cross-institutional research, the libraries of the future, and electronic course content. In the research arena, large shared computation services can now be effectively provided in location-independent ways. Communities of researchers can be brought together to use tools and systems regardless of the availability of local resources. These changes may very well level the playing field for researchers at smaller institutions. For libraries, we are seeing some very interesting partnerships with commercial entities, such as Google, and cross-institutional collaborations for providing digital archive services, such as HathiTrust (<http://www.hathitrust.org/>). In the last area, electronic content for courses presents an even greater opportunity to lower cost models and revolutionize much of the traditional approach to the textbook paradigm. The current model, which represents huge costs for students, has generated considerable interest over recent years. Student-led groups have been working on open-textbook efforts that are enabled primarily through the availability of electronic content (<http://www.maketextbooksaffordable.org/statement.asp?id2=37614>). The recent emergence of popular electronic readers such as the Amazon Kindle and the Sony Reader Digital Book could be the key innovations for further advancing this work.

5. What is the biggest challenge you've had to face so far in the economic downturn? What do you think will be the biggest challenge still to come for your IT department, for your institution, and/or for higher education?

Budget crises are cyclical, with some being more dramatic than others. This current cycle is different in its size (in California alone, the state budget shortfall is over \$40 billion), its breadth, and its expected length of duration. Clearly, short-term stop-gap measures that may have been sufficient in the past—measures such as curtailing staff travel and professional development or slowing the timeline for new hires—are simply insufficient now. We need to make long-term, permanent, sustainable changes, and we need to make them very quickly.

In many IT organizations, this approach has required, and will likely continue to require, reducing the number of staff—not through attrition or hiring freezes but through layoffs. Berkeley's central IT organization made the decision to reduce our staff size by looking at technical skill sets and alignment with our strategic directions. We identified which technologies were not core to our ongoing strategy and then focused reductions in those areas.

Although the current budget crisis is significant, I believe the crisis has exposed several other issues that have far greater long-term significance. First is the question of whether this is a resetting of education funding levels to a new, albeit lower, sustainable level or whether we are seeing the beginning of the true end to public support for higher education. The latter is a radical consideration, but many large public institutions have already dropped to single-digit public funding. The second issue relates more to the pace of change. The current financial situation will likely result in an accelerated adoption of new, lower-cost services and service models. How will IT professionals, and the larger campus community, handle this dramatically increased rate of change in the technical environment? Rather than allowing for a slow and orderly transition from one approach to another, we may be forced, by financial necessity, to adjust to change more quickly. CIOs and IT leaders will need to be prepared to help not just their own organizations but the entire campus community as we navigate what promises to be a challenging yet exciting time.