The EDUCAUSE annual publication of top IT issues has long resonated as a yearly snapshot of the most pressing issues for IT leaders in higher education. In 2000, EDUCAUSE changed the method by which the issues were selected and ranked, instituting a member survey. For twelve years, members were asked to select the five most-important IT issues out of a selection of about thirty in each of four areas: (1) issues that are critical for strategic success; (2) issues that are expected to increase in significance; (3) issues that demand the greatest amount of the campus IT leader’s time; and (4) issues that require the largest expenditures of human and fiscal resources.
To echo the 2000 article that inaugurated the new survey methodology, this year we “put a new spin on this tradition”—in response to perceptions that the top issues were at risk of becoming a stale recycling of the same fifteen or so issues (many of the thirty choices never made the cut). In 2011, EDUCAUSE appointed a research panel of IT leaders from nineteen representative member institutions to both identify and prioritize the top IT issues facing their institutions. In two focus group sessions in September and October 2011, the panel members were asked the question: “What is the single-biggest IT-related issue currently facing your institution?” In an online survey in December 2011, panel members were asked to select the top IT issues for 2012 from the results of those focus groups and were invited to provide additional suggestions. Finally, the IT Issues Panel met in January 2012 to review the survey results and write-ins before voting on the final set of issues.

The resulting list of top-ten IT issues was surprisingly different from those of previous years. Only two of this year’s top-ten issues map cleanly onto previous years’ lists: Funding information technology strategically; and Establishing and implementing IT governance throughout the institution. Several others resemble issues from previous years, whereas some are completely new. The top-ten issues are summarized below. For each issue, members of the 2011–2012 EDUCAUSE IT Issues Panel also offer a set of strategic questions intended to encourage further framing and discussion.
Updating IT Professionals’ Skills and Roles to Accommodate Emerging Technologies and Changing IT Management and Service Delivery Models

IT professional development is not necessarily about a programmer learning a new language. The issue is much broader, focusing on the changing way information technology delivers and manages technology services and on how the IT staff must adapt accordingly. Although the CIO’s changing role has received much attention in recent years, with the need for CIOs to acquire or enhance their strategic planning, relationship management, and communications skills, many other roles in the IT organization are also evolving in similarly disruptive ways.

This “service broker” role requires negotiation, contract review, security review, and product/vendor-vetting skills—skills that many IT staff members do not possess today. Other roles related to process redesign, continuous improvement, the Information Technology Infrastructure Library (ITIL), and metrics and analytics will also require new skills. Other capabilities requiring new roles—including project management, knowledge management, and relationship management—have been around longer but may still be new to some IT organizations.

Strategic Questions for Updating IT professionals’ skills and roles to accommodate emerging technologies and changing IT management and service delivery models:

- What are the next major initiatives planned for the IT organization?
- What nontechnical skills—for example, communications, political, consultative, negotiation, and contract-management skills—will be required for project success?
- Are there entirely new roles that are required? Will those roles be added to existing jobs, or will new jobs be required?
- What implications do the new required skills—and roles—have for the organization of information technology?
- How expert are the staff members in these skills?
- What is the professional-development strategy to close these skill gaps?
- How can the IT staff balance professional-development needs with day-to-day operational needs?

“It is incumbent upon [IT leaders] to prepare their staff for these changing roles. It is, however, quite difficult to do this in a ‘just-in-time’ manner. Our existing technical staff members are fully committed to their current roles and may not have the free work-cycles to focus on new responsibilities.”

—NADINE STERN
Associate CIO for Operations and Planning, Princeton University

Top-Ten IT Issues, 2012

1. Updating IT professionals’ skills and roles to accommodate emerging technologies and changing IT management and service delivery models
2. Supporting the trends toward IT consumerization and bring-your-own device
3. Developing an institution-wide cloud strategy
4. Improving the institution’s operational efficiency through information technology
5. Integrating information technology into institutional decision-making
6. Using analytics to support critical institutional outcomes
7. Funding information technology strategically
8. Transforming the institution’s business with information technology
9. Supporting the research mission through high-performance computing, large data, and analytics
10. Establishing and implementing IT governance throughout the institution
ISSUE #2
Supporting the Trends toward IT Consumerization and Bring-Your-Own Device

While the technology landscape has never been more personal or easy to use, it is simultaneously increasingly complex to manage and support. Faculty, staff, and students no longer need the IT organization as an intermediary in their adoption and application of the most commonly used technologies. They arrive with mature personal computing environments that they have self-configured to meet their specific needs, preferences, and styles of work and recreation. Any college or university that maintains hard-and-fast rules about which devices and communication tools must (or may not) be used risks being irrelevant. Yet the institution's data and intellectual property must be safeguarded, no matter where it is stored, transmitted, or accessed. Even the most strategic and flexible IT organization may, at times, need to be reactive. Institutions need to learn to adapt to and leverage personal computing environments, not proscribe them.

Strategic Questions for Supporting the trends toward IT consumerization and bring-your-own device:

- How does an institution define consumerization of information technology? What devices, operating systems, applications, and services fall under this umbrella?
- What are the infrastructural implications of IT consumerization: for example, bandwidth and connectivity? How will the IT organization address them?
- What are the IT security implications of IT consumerization—for example, information and resource access and privacy? How will the IT organization address them?
- How does IT consumerization affect the IT organization's support strategy—for example, help desks? When is a problem the institution's responsibility, and when is it the user's responsibility?
- What policies around security and provisioning should institutions change or adopt?
- Should institutions that provide smart phones or other devices revisit those practices?

“Resource-constrained organizations face differentiated demands in supporting and integrating the vast choices of technologies brought to campus, while even wealthier organizations must justify and prioritize resource allocations according to user-driven innovation. The IT organization is no longer in control, and it’s not clear who is!”
—ANN KOVALCHICK
CIO, Drake University

ISSUE #3
Developing an Institution-wide Cloud Strategy

The National Institute of Standards and Technology (NIST) defines cloud computing as “a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources.” But people refer to many definitions of “cloud.” On the one hand, the cloud computing conversation is about alternative sourcing for services traditionally offered in an “on-premise” mode by campus IT organizations (e.g., Google Apps for Higher Education). On the other hand, the cloud represents something brand-new and different. New cloud-only services

“The challenge is to figure out how to integrate these personal computing environments into our institutional architectures and services in a way that is highly functional and convenient and that addresses the legitimate institutional concerns for security, privacy, and compliance. IT organizations will stand to benefit with happy, productive users if they achieve this integration.”
—MICHAEL MCPHERSON
Associate Vice President and Deputy CIO, University of Virginia

“Resource-constrained organizations face differentiated demands in supporting and integrating the vast choices of technologies brought to campus, while even wealthier organizations must justify and prioritize resource allocations according to user-driven innovation. The IT organization is no longer in control, and it’s not clear who is!”
—ANN KOVALCHICK
CIO, Drake University

“The pace of change is too great to let the strategy get buried under the details. We must have a sound set of principles and apply them to make quick choices with realistic contingency plans always at the ready. Only in this way will we be able to take advantage of the amazing opportunity presented by the cloud.”
—MICHAEL MCPHERSON
Associate Vice President and Deputy CIO, University of Virginia
Looking beyond Information Technology: Institutional Issues for 2012

The IT Issues Panel discussions were not limited to the IT organization. If information technology is to deliver value to higher education, IT leaders must understand higher education, its most pressing needs, and how technology can help. Panel members turned their attention beyond the central IT organization, using their campus IT leadership perspective to identify the five top institutional issues facing colleges and universities.

1. Improving student success
“It is a real problem. Students spend so much time on remedial work that they tend to drop out because they are not achieving their goal very quickly. At the same time our institution must graduate more students. So we are doing a lot of studying, research, and soul-searching about how to deal with the problem of helping the high school student perform better and allowing the student to succeed.”
—Roger Flahive, CIO, County College of Morris

2. Developing a sustainable business model for higher education while reducing or containing the costs
“The challenge is to balance academic standards and requirements with enrollment growth and financial aid budgets to ensure the overall fiscal health of the institution. Institutions need to develop realistic sustainable plans that will not double the cost of higher education over the next seven years.”
—Joseph Gargiulo, CIO, Southern Methodist University

“The model itself will need to transform to reduce costs appreciably, to center on student learning outcomes, and to meet the needs and requirements of the changing student demographic. This will require the adoption of different delivery systems and the exploration of different teaching methods.”
—Kelley L. Bradder, Vice President for Information Services, Simpson College

3. Determining how higher education is going to change over the next ten to twenty years
“The entire environment that dictates policies for tenure and promotion will change. Information technology and libraries have brought the resources and inherent power of information to the footsteps of every student and faculty. The movement for scholarly communications and open access will eventually result in new models for information access. With more open access and greater self-sufficiency, students and faculty will look to the IT organization and libraries for guidance, for refreshed policies, and for hybrid mechanisms for content management and preservation.”
—Loretta Parham, CEO and Library Director, Atlanta University Center Woodruff Library

4. Helping all institutional constituents—faculty, students, staff, parents, alumni—understand and adapt to the impending changes in higher education
“It is helping the faculty, staff, and students deal with the constant ambiguity and volatility of the new reality. People are saying I learned another new thing and now it is changing. The fact is that is the norm now.”
—Ann Kovalchik, CIO, Drake University

5. Embedding information technology into institutional decision-making
“The failure to integrate information technology effectively into decision-making risks bolting technology onto a business process or learning environment in a manner that creates a costly and difficult-to-correct mistake. Instead, institutional decision-making that accounts for information technology will benefit by examining total cost of ownership, switching costs, user-support needs, system requirements, market forces and trends, and IT skill and expertise capacity. Measure twice, cut once.”
—Ann Kovalchik, CIO, Drake University

“The bottom line is that you have no choice: do it, do it soon, and keep it agile.”
—Joseph Vaughan, CIO and Vice President for Computing, Harvey Mudd College

(such as the Pearson OpenClass learning environment and Workday administrative services) are appearing almost every day, with no on-premise option.

Given the tremendous diversity of technologies, approaches, and providers, colleges and universities need to develop a coherent strategy about alternative sourcing. A successful strategy is not focused on technologies but, rather, is focused on issues such as architecture, business models and requirements, procurement and contract management, contingency planning, security, privacy, and compliance. For services that remain available in an on-premise model, campus IT organizations will need to continually demonstrate the value of that model in the face of cloud offerings. For new, cloud-only offerings, the institution will need to establish a strategy for evaluation, selection, risk
assessment, and vendor management. It will also need to establish a strategy around data-integration tasks that may have to be undertaken by the campus IT organization.

Strategic Questions for Developing an institution-wide cloud strategy:

- How will the cloud service under consideration add value to the institution?
- How do IT leaders secure end users’ buy-in and adoption for this cloud service?
- What are the cost, security, support, and staffing implications of adding this cloud service? Has the ROI estimate adequately accounted for the financial, political, and organizational costs of making the change?
- What are the vendor-selection criteria?
- What is the implementation strategy?

ISSUE #4
Improving the Institution’s Operational Efficiency through Information Technology

Today, using information technology to improve operational efficiency is no longer just desirable; it has become an imperative due to the ever-shrinking resources brought about by the current economic downturn. Most institutions have many of the required technologies (e.g., workflow, electronic forms, and digital signing) in place, but not everyone has broadly restructured business

“To be successful will require rethinking many of our fundamental business processes to minimize labor costs and increase timely access to the information needed to support the facilities and services on our campuses.”

—PAUL BISHOP
Vice President, Information Technology, Santa Barbara City College
Looking beyond the Campus: Opportunities for Cross-Institutional Collaborations

In the May/June 2011 issue of EDUCAUSE Review, which contained last year’s top-ten IT issues article, EDUCAUSE President and CEO Diana Oblinger urged the consideration of cross-institutional collaborations as a model for these new times: “What if our colleges and universities expanded our application of the common good beyond collaboratively producing datasets, books, and learning materials? What if our institutions established processes for sharing library and IT services and for ‘de-duplicating’ resources across hundreds of institutions? . . . The process of coherent redesign is not quick or easy. But it may be one of higher education’s best options for coping with a challenging future.”*

In discussing opportunities for cross-institutional collaboration, the IT Issues Panel produced a list of what they consider to be the four most-promising areas:

1. **Aggregation of demand for software licenses, hardware, and professional services**

“Finding a balance between volume discounts and the needs of individual departments/institutions is the key to effectively aggregating demand for IT-related purchases.”

—Kathy Drumm, Executive Vice President, Central Piedmont Community College

2. **Disaster recovery and business continuity**

“Staff can share best practices and build on the sense of community commonly found in higher education. There is a shared sense of urgency. There is also a shared sense of commiseration! Expectations must be clearly defined and documented, but the opportunities and possibilities are beneficial to both the participating institutions and their IT organizations.”

—Rebecca Gray, Executive Director and CIO, Information Technology Services, Tarleton State University

3. **Aggregation of specialized technical expertise**

“It presents opportunities among institutions to collaborate and effectively to solve an institutional problem, deliver staff development, and provide business continuity for those institutions where some functions are limited to a single person or less.”

—Kelley L. Bradder, Vice President and CIO, Simpson College

“As colleges and universities contemplate the ‘switch to cloud’ and the associated challenges, CIOs and other campus leaders should reflect on this potential value and find ways to overcome the initial obstacles.”

—Joseph Vaughan, CIO and Vice President for Computing, Harvey Mudd College

3 (tie). **Commodity services**

“While there is an implicit understanding about the benefits of collaboration, there is a lot of room for improvement here. For example, roughly 41 of the 2,200 institutional members of EDUCAUSE know the convenience of collaborating on identity management for wireless access by implementing edu-roam.** If this number was flipped, and the majority of EDUCAUSE members collaborated on identities, then imagine the scenario of professors visiting your institution and not having to worry about providing accounts for network access. The home institution already did all the vetting for you. This saves time for your IT staff, which turns into money saved, all by removing the redundant efforts of account management.”

—Allie Hopkins, Senior Manager, Louisiana State University


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<th>Question</th>
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<td>What are the institutional strategies, policies, and governance models to map out and redefine business processes?</td>
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<td>2</td>
<td>What institutional functional business processes could most benefit from greater operational efficiencies with information technology?</td>
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** Eduroam-US Institutions,** [http://www.eduroamus.org/eduroam_us_institutions].

Processes to take advantage of the new technologies.

This is easier said than done. Electronic workflow cannot realize its full potential when implemented piecemeal and opportunistically. Process optimization occurs at the intersection of functional (administrative, academic, research) and technical domains, and it drives their synthesis. Alternatively, workflow may be deployed following a classical functional/technical model. Adding to the challenge is the indeterminate vendor environment. The ideal workflow system builder brings granular business knowledge as well as technical knowledge to the table. Many vendors have a presence in the workflow space, but there are no dominant players.

Strategic Questions for Improving the institution’s operational efficiency through information technology (e.g., automated workflow, paperless business environment, document management):
Looking beyond the IT Organization: Considerations for Institutional Leadership

Many of the issues and questions in this article extend beyond the IT organization. In particular, for issues #4 through #10 (#1, #2, and #3 were less relevant to non-IT leaders), CIOs will need to involve administrative and academic leaders to answer the following questions:

**Issue #4: Improving the Institution’s Operational Efficiency through Information Technology**
- What institutional functional business processes could most benefit from greater operational efficiencies with the IT organization?
- What are the institutional strategies, policies, and governance models to map out and redefine business processes?
- Does the IT organization have strong-enough partners and partnerships in the institution to define new processes and to champion and implement change?
- What new expertise and roles are required to implement new processes and technologies?
- What are the implementation, user buy-in, and management strategies for these newly redesigned systems?

**Issue #5: Integrating Information Technology into Institutional Decision-Making**
- Does IT leadership understand the institution's strategic goals and business requirements?
- Do the goals of the IT organization align with the institution's strategic goals?

**Issue #6: Using Analytics to Support Critical Institutional Outcomes**
- Why does analytics matter to the institution? What strategic problems or issues can analytics help the institution address? What will be the institution's initial focus for analytics: institutional performance, student performance?
- What institutional policies need to be updated or put in place in response to analytics initiatives?
- What are the institution's existing capabilities and requirements in terms of data (e.g., data quality, data federation), infrastructure, processing, governance, and staffing for analytics?
- What steps will the IT organization and the institution take to develop a comprehensive approach toward analytics to ensure the analysis leads to actions and improvements?
- What are the institution's cultural issues around buy-in and adoption of analytics? How does analytics relate to accountability?

**Issue #7: Funding Information Technology Strategically**
- How can IT leaders build the relationships that assure people that the IT organization is doing the very best possible with the resources available?
- How can IT leaders verify they are doing the very best with those resources?
- How can IT leaders interweave an IT funding component into broader, institutional initiatives to ensure that the IT organization is funded appropriately to be able to deliver what is needed?

**Issue #8: Transforming the Institution’s Business with Information Technology**
- Does the institution's strategic plan include transformative objectives?
- How can the institution support experimentation with technology to transform teaching and learning without unduly risking students’ learning outcomes?

**Issue #9: Supporting the Research Mission through High-Performance Computing, Large Data, and Analytics**
- What is the institution's research strategy? How can IT leaders provide input into this strategy? How can the central IT organization support the institution's research strategy? What is the institution's strategy for funding IT infrastructure in support of research?
- What is the central IT organization's role in securing research funding?
- How can central IT develop relationships with the institution's research community? What is the balance between the central IT organization and decentralized IT support for the institution's research mission?

**Issue #10: Establishing and Implementing IT Governance throughout the Institution**
- Are the institution's IT governance principles and structure widely understood by those involved?
- Is the institution's IT governance deemed effective? Why or why not? If not, how can IT leaders improve it?
- What is the IT governance's institutional realm of influence? Does IT governance participate in institutional budgetary processes?
Does the IT organization have strong-enough partners and partnerships in the institution to define new processes and to champion and implement change?

What technology pieces are in place now (e.g., workflow, electronic forms, and digital signing) that can support operational efficiency initiatives? What gaps exist, and how can the institution fill them?

What new expertise and roles are required to implement new processes and technologies?

What are the implementation, user buy-in, and management strategies for these newly redesigned systems?

“My dream is that someday the word ‘technology’ disappears from the discussion as it is represented today and, instead, there is simply a discussion about delivering services that make a difference.”

—REBECCA GRAY
Executive Director and CIO, Information Technology Services, Tarleton State University

ISSUE #5
Integrating Information Technology into Institutional Decision-Making

At many institutions, information technology is not sufficiently integrated into the senior administration leadership structure to enable the institution to fully embrace and benefit from technology’s strategic advantages. As soon as some people talk about technology, they may put it in a box, viewing information technology as only an enabling function and not recognizing its broader, pervasive nature.

“My dream is that someday the word ‘technology’ disappears from the discussion as it is represented today and, instead, there is simply a discussion about delivering services that make a difference.”

—REBECCA GRAY
Executive Director and CIO, Information Technology Services, Tarleton State University
The ability to know when information technology is essential to strategic decision-making requires that an institution determine what it wants from technology. The costs and benefits of investing in technology resources weigh differently depending on whether technology is expected to function as merely a utility or is intended to operationalize institutional strategy and transformative change.

Strategic Questions for Integrating information technology into institutional decision-making:

- Does the IT leadership understand the institution's strategic goals and business requirements?
- Do the goals of the IT organization align with the institution's strategic goals?
- Can IT leadership articulate a supportive IT strategy? How can CIOs transform sidebar discussions about “technology” into a discussion about the tools, capabilities, and services that an institution needs in order to be successful?
- Do IT leaders possess the communications, strategic thinking, and negotiation skills to interact effectively with the senior administration? If not, what is their professional-development strategy?
- How can IT leaders move a discussion about “technology” to a discussion about initiatives, strategic goals, and projects and, as part of the conversation and planning, consider all of the requirements—for example, funding, staffing, tools, timelines, training, and recurring investment?
- Does the entire IT organization understand the nature of the many “businesses” at the institution well enough to be able to understand and articulate how technology can support and advance goals?

### ISSUE #6

**Using Analytics to Support Critical Institutional Outcomes**

Accountability and, increasingly, the need to give students the information they require are driving the use of analytics in higher education. Institutions are under continued pressure from accreditors and public funding sources to demonstrate that student outcomes are improving and that institutions are being run efficiently. Students and parents are beginning to clamor for more direct and “real-time” feedback by gaining access to the data that institutions collect about student performance. Sophisticated analytical tools provide a means to draw meaningful conclusions. New interactive data-visualization tools can bring complex data to life and make evidence easily and readily accessible to executives, managers, and the public.

Analytics have been a vital and valuable tool in many student success projects such as Achieving the Dream, Completion by Design, Course Signals, and Next Generation Learning Challenges (NGLC). Beyond higher education, research is showing that organizations using analytics are more efficient and effective.

Many challenges will make it difficult for higher education to adopt and benefit from analytics, whether applied to institutional or student performance:

- Academic and administrative leaders need to understand what analytics can do and how institutions need to prepare.
- The IT organization and the institutional research organization need to strengthen their relationship, because both groups have critical, complementary capabilities.
- IT leaders need to manage up and down, communicating the potential value of analytics while preparing the IT organization to deliver. Analytics has the potential to greatly enhance the strategic contribution that the IT organization makes to the institution, but this will vary across institutions and across IT leaders.
- The current shortage of professional analysts across all industries is expected to continue for a number of years.

The outputs of analytics can be only as good as the quality of the data. As Kathy Drumm, Executive Vice President at Central Piedmont Community College, observed: “Junk in, junk out.”

Strategic questions for Using analytics to support critical institutional outcomes (e.g., the cost of higher education, student success):

- Why does analytics matter to the institution? What strategic problems or issues can analytics help the institution address? What will be the institution’s initial focus for analytics: institutional performance, student performance?

“The origins and the outcomes of analytics are the most important: determining the strategic questions to which data can be applied and using the results to make improvements.”

—SUSAN GRAJEK

Vice President of Data, Research, and Analytics, EDUCAUSE
• What institutional policies need to be updated or put in place in response to analytics initiatives?
• What are the institution’s existing capabilities and requirements in terms of data (e.g., data quality, data federation, data policy), infrastructure, processing, governance, and staffing for analytics?
• What is the role of the IT organization in analytics initiatives? Will the organization lead the provision of analytics services, or will it simply be a link in the overall supply chain?
• What are the institution’s cultural issues around buy-in and adoption of analytics? How does analytics relate to accountability?
• What steps will the IT organization and the institution take to develop a comprehensive approach toward analytics to ensure the analysis leads to actions and improvements?

ISSUE #7

Funding Information Technology Strategically

The IT funding issue is an ongoing conversation, not a problem that can be resolved conclusively. In addition to the general financial squeeze that educational institutions currently feel, other important factors are influencing campus IT funding. As IT resources are becoming more decentralized—putting resources where they are needed—the IT funding big picture becomes more difficult to see clearly. For similar reasons, “Transparency and ongoing communication across the campus are more critical than ever to avoid unnecessary redundancies and to help ensure that different groups do not inadvertently work at cross-purposes.”

—CHRISTOPHER WATTS
Director, Newell Center for Arts Technology, St. Lawrence University

“Transparency and ongoing communication across the campus are more critical than ever to avoid unnecessary redundancies and to help ensure that different groups do not inadvertently work at cross-purposes.”

—CHRISTOPHER WATTS
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it is very important that IT funding is not viewed as unrelated to other academic and operational decision-making about funding. Information technology serves the mission of the institution; strategic decisions about funding can be made only when the relationship between technology and that mission is clear. As Christopher Watts noted: “To put it another way, you don’t plan a trip to the moon without arranging for transportation, and you don’t build a rocket if you’re not planning a trip.” Thus, the IT organization needs to engage its institutional colleagues in the processes of setting funding priorities and building their ownership in the decisions.

Strategic questions for Funding information technology strategically:

- How can IT leaders build the relationships that assure people that the IT organization is doing the very best possible with the resources available?
- How can IT leaders verify they are doing the very best with those resources?
- How can IT leaders create an institution-wide view of IT funding and expenditures? What relationships and partnerships will they need to cultivate to do so? What business processes might need to be changed to create such a view on an ongoing basis?
- How can IT leaders interweave an IT funding component into broader, institutional initiatives to ensure the IT organization is funded appropriately to be able to deliver what is needed?

“Transforming your business using information technology as an attraction will ensure that your student base stays aligned with prospective employers’ needs and will create collaborative opportunities with unthought-of partners, providing profitable ventures for your institution and state.”

—ALLIE HOPKINS
Senior Manager, Louisiana State University

“‘We can make [institutional colleagues] partners, or we can make them critics—collaborators or victims.’”

—JAMES L. BINGHAM
Associate Vice Chancellor, Information Resources, The University of Kansas Medical Center

Many institutions have already used information technology to achieve efficiencies. But “transformation” is a word du jour. Information technology allied with process reengineering and continuous improvement is the pathway to transformation. All aspects of higher education are being transformed, including teaching and learning, scholarship, research, institutional advancement, admissions, and administrative services. Information technology is never sufficient, but is almost always necessary, for those transformations to have both efficient and effective outcomes.

Strategic Questions for Transforming the institution’s business with information technology:

- Does the institution’s strategic plan include transformative objectives?
- Is the IT organization viewed as a trusted partner in institutional transformation? If not, why not?
- How can the institution support experimentation with technology to transform teaching and learning without unduly risking students’ learning outcomes?
- Are the process reengineering and continuous improvement capabilities in place to enable transformative information technology?
- Is the institutional culture a barrier to or an enabler of transformation?
- What implications do transformative initiatives have for the IT organization during them and afterward?
- How can IT leaders and their organizations assist in building relevant IT-related academic programs as well as supportive teaching and learning tools? In which IT-related occupations can the institution offer the greatest job placement opportunities for its students?
Ensuring adequate infrastructure for researchers is challenging higher education institutions, in terms of both physical and human resources, at a pace unseen before. The amount of information being generated continues to grow at an incredible rate, in both big and small science. Network, storage, analytical,

“Capturing economies of scale through collaboration is the only way information technology is going to provide the infrastructure needed to stay competitive and support the next generation of discovery and innovation. This is going to take enlightened leadership, and universities and their CIOs have a significant role to play in that effort.”

—BO WANDSCHNEIDER
CIO and Associate Vice Principal, Information Technology, Queen’s University
and visualization tools need to be implemented, supported, and grown at an unprecedented pace.

Strategic questions for Supporting the research mission through high-performance computing, large data, and analytics:

- What is the institution’s research strategy? How can IT leaders provide IT input into this strategy? How can the central IT organization support the institution’s research strategy? What is the institution’s strategy for funding IT infrastructure in support of research?
- What is the central IT organization’s role in securing research funding?
- How can the central IT organization develop relationships with the institution’s research community? What is the balance between the central IT organization and decentralized IT support for the institution’s research mission?
- What are the infrastructural (e.g., networks, computing, data storage, remote instrumentation), application, support, and staffing (levels and specialized roles) implications for the central IT organization in supporting the institution’s research mission?
- How can the central IT organization balance research needs with academic and operational needs?
- What cross-institutional collaborations exist to help the central IT organization support the institution’s research mission? How do IT leaders evaluate the worth and risks of such collaborations? How do they foster participation and buy-in?

ISSUE #10
Establishing and Implementing IT Governance throughout the Institution

Establishing an IT governance process is possibly the single most-effective step toward effective IT leadership because it will provide a framework for defining decision rights around IT priorities and resource allocation.

Good IT governance is especially imperative because digital technologies are embedded within nearly every operational process on college and university campuses. The expense and strategic value of technology investments, as well as the complexity of IT decisions, warrant an IT governance framework that can ensure coordinated decisions regarding the acquisition of technology devices, software, and standards. IT governance can guide coordinated purchasing, implementation, and support decisions to improve the user experience and can help execute technology standards where appropriate and customize where necessary. This is perhaps best stated by Peter Weill and Jeanne W. Ross in their book *IT Governance: How Top Performers Manage IT Decision Rights for Superior Results.*

“We define IT governance as specifying the decision rights and accountability framework to encourage desirable behavior in using IT. IT governance is not about making specific IT decisions—management does that—but rather determining who systematically makes and contributes to those decisions.”

“Once a structure and process—a framework—is established, the institution can focus on the quality of decisions that flow from it. A good framework will result in decisions that are well understood and widely accepted.”

—JOSEPH VAUGHAN
CIO and Vice President for Computing, Harvey Mudd College

Strategic questions for Establishing and implementing IT governance throughout the institution:

- Are the institution’s IT governance principles and structure widely understood by those involved?
- Is the institution’s IT governance deemed effective? Why or why not? If not, how can IT leaders improve it?
- What is the IT governance’s institutional realm of influence? Does IT governance participate in institutional budgetary processes?
- How does the institution’s IT governance structure adapt to new circumstances and issues such as the decentralization of information technology, new technologies, outsourcing, and cloud-based services?

Conclusion

Some readers may have noted the absence of issues related specifically to teaching and learning in this year’s list. The panel did not ignore educational technology. Using technology to support and advance teaching and learning frequently surfaced in panel discussions, and the topic is threaded throughout this article. Whether technology is used to make teaching and learning more efficient (Issue #4), to transform it entirely (Issue #8), or to power analytical activities to improve educational outcomes (Issue #6), the panel consistently recognized the
On the EDUCAUSE IT Issues Panel website
(http://www.educause.edu/ITIssues)

- Recommended readings for each of the top-ten IT issues
- Links to EDUCAUSE resources for each of the top-ten issues
- HTML and PDF links to this EDUCAUSE Review article

strategic value that information technology can deliver to teaching and learning.

Perhaps the most obvious change this year is that previous lists tended to reflect the departments within IT organizations: administrative systems, academic computing, IT security, networking, the CIO's office, etc. This year's list transcends the IT org chart with two predominant themes: the IT organization's obligation to the institution; and the IT organization's relationship to technology outside the institution. The former views the IT organization as an enabler and partner in helping colleges and universities adapt to and even capitalize on changing realities and needs via automation (Issue #4), analytics (Issue #6), business transformation (Issue #8), and research computing (Issue #9). It also recognizes that the IT organization's relationship with institutional leaders must be effective for it to truly support institutional priorities, by integrating information technology into institutional decision-making (Issue #5), funding information technology strategically (Issue #7), and establishing and implementing IT governance throughout the institution (Issue #10).

The IT organization is no longer the only or the most convenient technology solution provider, and IT leaders thus must understand the opportunities and challenges of external technologies and IT services. With both the consumerization of information technology (Issue #2) and the need to develop an institution-wide strategy to maturing cloud solutions (Issue #3), the panel recognized the IT organization's need to manage the blurring boundaries and new potential of technology beyond the institution. Even the one inward-facing issue—Upgrading IT professionals' skills and roles to accommodate emerging technologies changing IT management and service delivery models (Issue #1)—was framed to acknowledge the IT organization's newly strategic requirements in relation to the institution and to the external environment.

The change in methodology resulted in a considerably different list of issues. Most of the issues the panel identified were not among the thirty issues offered to survey respondents in previous years. Giving members a blank slate and a forum to discuss their major challenges and priorities surfaced what is arguably an updated picture of information technology in higher education today. It is our hope that readers will find this list, and the panel's accompanying reflections and questions, to be useful guidance in the months to come.

Notes
1. The EDUCAUSE IT Issues Panel (http://www.educause.edu/ITIssues) includes individuals from EDUCAUSE member institutions to provide quick feedback to EDUCAUSE on current issues, problems, and proposals across higher education information technology. Panel members, who are recruited from a randomly drawn and statistically valid sample to represent the EDUCAUSE membership, serve for one year, with staggered terms. Panel members meet quarterly for 90 minutes via webinar or in person. The meetings, facilitated by EDUCAUSE Vice President Susan Grajek, are designed to stimulate an ongoing dialogue to flesh out and refine an array of open-ended technology questions about the IT organization, the institution, and cross-institution boundaries. The members discuss, refine, and vote on the most relevant underlying issues or options. Grajek explains: "There is a richness behind the process that is a little different from giving people a list of topics to vote on. We introduce open-ended questions and let the members bat ideas back and forth. Sometimes there is debate, and then it transitions to refining and defining the issue and what it really means. As facilitators, we summarize what we heard and reflect it back to the panel members. We often get it right, but sometimes we don't: panel members correct us until we arrive at a final list of issues for the panel to vote on. Our process enables the panel to move from a very open-ended question to a set of bulleted answers, adding some depth in quite a short period of time."

2. This is not particularly surprising. IT funding has made the list in each of the past twelve years, and IT governance has made the list every year since it first appeared, in 2004.


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