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EDUCAUSE

review

JANUARY/FEBRUARY 2018





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FEATURE

10 Top 10 IT Issues, 2018: The Remaking of Higher Education

Susan Grajek and the
2017-2018 EDUCAUSE
IT Issues Panel

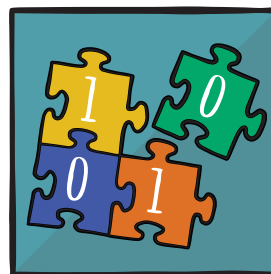
The 2018 Top 10 IT Issues show how digital technology is remaking higher education through four key themes: institutional adaptiveness, improved student outcomes, improved decision-making, and IT adaptiveness.



Including:

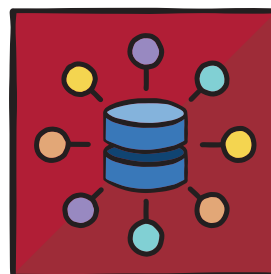
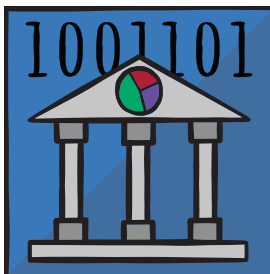
22 The Third Time's the Charm? Information Security at the Top of the List Again

Joanna Lyn Grama and Valerie M. Vogel,
with Michael Corn and Sharon Pitt



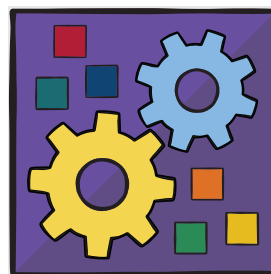
26 Teaching, Learning, and IT Issues: Points of Intersection

Malcolm Brown and Veronica Diaz



34 Enterprise IT Perspectives on the 2018 Top 10 IT Issues

Betsy Tippens Reinitz, with John Barden,
Josie DeBaere, William Liddick,
John Rathje, and David Weil



60 EDUCAUSE Research Snapshot: Top 10 IT Issues 2018

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COLUMNS

4 Homepage

[From the President]

Strategic IT and the 2018 Top 10 IT Issues
John O'Brien

8 Leadership

[Views from the Top]

Technology and the Remaking of Higher Education: A Longer View
Susan Grajek

62 Connections

[Community College Insights]

Information Technology and Its Future Role in Student Success
Kevin Pollock,
Celeste M. Schwartz,
and David Buck

64 E-Content

[All Things Digital]

The Link to Content in 21st-Century Libraries
Joan K. Lippincott

66 New Horizons

[The Technologies Ahead]

The Top 10 IT Issues and the Future of Learning Logistics
Kyle Bowen

68 Viewpoints

[Today's Hot Topics]

Accessibility: A Shared Campus Responsibility Best Accomplished with Executive Support
Sue Cullen



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The EDUCAUSE Top 10 IT Issues Website Offers the Following Resources:

- A video summary of the Top 10 IT Issues
- Recommended readings and EDUCAUSE resources for each of the Top 10 IT issues
- An interactive graphic depicting year-to-year trends
- Top 10 IT Issues lists by institutional type
- Additional subject-matter-specific viewpoints on the Top 10 IT Issues
- The Top 10 IT Issues presentation at the EDUCAUSE 2017 Annual Conference



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Strategic IT and the 2018 Top 10 IT Issues

This year marks the twentieth anniversary of the founding of EDUCAUSE, a nonprofit association created from the merger of CAUSE and Educom. These two respected organizations had each contributed more than three decades of support to the higher education IT community.¹

Anniversaries are wonderful opportunities to look back, take stock of what has been accomplished, and consider the future. As I reflect not only on this significant milestone but also on the 2018 EDUCAUSE Top 10 IT Issues, I'm increasingly convinced that we are at a remarkable moment when it comes to the full realization of information technology as a strategic asset for our colleges and universities.

In so many ways, EDUCAUSE has been engaged in a conversation about the strategic nature of information technology since the association was founded. However, it seems to me that beyond the campus IT organization, a broad understanding that technology is much more than a utility has been intermittent over the years. The view that information technology should be, as Dartmouth College CIO and Vice President Mitch Davis says, "silently awesome"² persists in some circles as senior campus leaders hold on to these legacy perceptions. Still, as new technologies have been deployed and paradigms have shifted, the strategic nature of technology has revealed itself "gradually and then suddenly" (to repurpose Ernest Hemingway).

I have a very clear recollection of a campus meeting in the late 1990s. We were engaged in a brainstorming session to address some of our most pressing challenges. Enrollment down? *Solved*: online courses! Parking lots too full? *Solved*: online students! I even recall that a campus official wondered out loud whether the solution to a notoriously asbestos-ridden building might well be—you guessed it—online programs. In those days, technology-fueled possibilities such as online courses became an unprecedented strategic fulcrum. That thrill eventually faded, to be replaced with other moments of strategic illumination including social media, big data, the cloud, MOOCs, and more—all very promising developments that captured the imagination of those outside the traditional sphere of IT influence. But as these ideas moved from headlines to project charters, non-IT senior leaders were free to resume their regularly scheduled programming.

Still, the landscape and strategic placement of technology has changed. IT advances are constant, not occasional, and technology on campus is ubiquitous and enterprise-critical. Meanwhile, presidents, provosts, and boards—under considerable pressure to improve student success—appreciate that technology offers some of the brightest hopes for moving this hard-to-move needle. For this reason, among others, *student success* became the foundational focus of the 2017 Top 10 IT Issues. And the 2016 Top 10 IT Issues stressed the degree to which information technology is an *institutional differentiator* when it comes to not only student success but also affordability, teaching, and research excellence.³

It's one thing, of course, to ask ourselves about the strategic nature of information technology and quite another to find evidence that those outside the IT organization are experiencing this strategic sea change. Yet in recent months we've seen exactly that. One example is the *American College President Study 2017*, from the American Council on Education (ACE). Written by and for college and university presidents, the report advises presidents to attend fully to technology, especially "using analytics functions to make better decisions and leveraging technology to scale out quality, cost-effective best practices."⁴

We are at a remarkable moment when it comes to the full realization of information technology as a strategic asset for our colleges and universities.

(continued on page 6)

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(continued from page 4)

Another compelling indicator that *strategic IT* is more than just a story that those of us in campus IT organizations tell ourselves is the *Statement on Innovation in Higher Education* released in November 2017 by the Association of Governing Boards of Universities and Colleges (AGB). Representing trustees, regents, and presidents at over 1,900 colleges and universities, AGB assembled a task force to develop a statement to address what it considers the “innovation imperative.”⁵ The statement begins by acknowledging that innovation has shaped higher education throughout its history. Tellingly, all the examples cited are either technologies (e.g., online courses and MOOCs) or innovations that heavily depend on technology (e.g., competency-based education). The statement concludes by spelling out six innovation principles. The last principle—on “the strategic role of technology”—is worth quoting in its entirety:

**“What’s not on the top 10 list for 2018?”
The answer: technologies.**

Innovation requires adequate resources, but that is not always enough. Because technology is a foundational part of virtually every innovative strategy, it is crucial that technology is recognized and treated as a strategic asset, not a mere utility to be paid for, turned on, and forgotten about. Boards should ensure that campus technology professionals are thoroughly involved in those projects that depend on technology for their success, including the planning stage. The president needs to be certain that the institution’s commitment to technology is well funded and staffed; however, presidents must also consider the strategic placement of technology within the organization. It will prove difficult, for example, for technology to serve as a strategic asset for innovation if the CIO is not at the table when key decisions are made at the cabinet level.

The AGB statement is primarily intended to underscore the vital need for a campus “culture of innovation,” but the conversation is framed by expressions of the transformational promise of technology and by the insistence that “a new level of collaborative leadership” is required, one in which information technology is part of the strategic decision-making fabric.

My favorite moment during the popular Top 10 IT Issues session at the EDUCAUSE annual conference in October 2017 was when someone in the audience observed that what’s *not* in the top 10 lists may be as important as what is and asked: “What’s not on the top 10 list for 2018?” The answer: technologies. When the value that technology brings to an institution is the value of a utility, the technologies themselves are the focus. But when information technology brings strategic value, the solutions and the technologies that power them are less important than the people and processes—which make all the difference in the 2018 Top 10 IT Issues.

Notes

1. “Roots of EDUCAUSE,” EDUCAUSE (website), accessed December 4, 2017.
2. Mitch Davis, personal conversation with the author.
3. Susan Grajek and the 2016–2017 EDUCAUSE IT Issues Panel, “Top 10 IT Issues, 2017: Foundations for Student Success,” *EDUCAUSE Review* 52, no. 1 (January/February 2017); Susan Grajek and the 2015–2016 EDUCAUSE IT Issues Panel, “Top 10 IT Issues, 2016: Divest, Reinvest, and Differentiate,” *EDUCAUSE Review* 51, no. 1 (January/February 2016).
4. Jonathan S. Gagliardi, Lorelle L. Espinosa, Jonathan M. Turk, and Morgan Taylor, *American College President Study 2017* (Washington, DC: ACE 2017).
5. AGB Board of Directors’ *Statement on Innovation in Higher Education*, November 7, 2017; “The Innovation Imperative,” *Trusteeship* 25, no. 5 (September/October 2017). Full disclosure: I was one of three external members of the innovation task force involved in creating this statement.

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Technology and the Remaking of Higher Education: A Longer View

The theme of the EDUCAUSE Top 10 IT Issues in 2018 is *The Remaking of Higher Education*. What will that remaking look like in the years to come? Where are we heading, and where is the most exciting place to be? We spoke with five leaders in our field about how higher education is changing and the contribution that technology is making:

- Bryan Alexander, futurist and author
- Tracy Futhey, VP and CIO, Duke University
- Tracy Schroeder, VP, Information Services and Technology, Boston University
- Vernon Smith, Provost, American Public University System
- Louis Soares, VP, Policy Research and Strategy, ACE

Their thoughts turned to higher education access and affordability, openness, artificial intelligence (AI), the learning experience, changes in the business model, and more. Although realistic about the challenges ahead, all five were optimistic and enthusiastic about the future of higher education and the role that technology can play.

Breaking the Iron Triangle

Anticipating technology's contributions to higher education within the next decade or so, Vernon Smith said: "Technology is starting to break the iron triangle of the cost, quality, and accessibility to our students." Until now, it has been possible to improve any two of the three sides of that triangle—but only two. However, digital infrastructure scales in ways that physical infrastructure does not. Smith believes advances in technology are beginning to make it possible to improve quality and accessibility while lowering costs—all at the same time. Tracy Schroeder also feels that access and affordability will improve, and Bryan Alexander foresees "massively increased access to higher education through the web, mobile devices, and open and other technologies."

Louis Soares and Tracy Futhey talked about how they believe technology will transform the learning experience. Futhey envisions a revamping of the undergraduate learning experience in a way that would bring it closer to the more individualized postgraduate learning experience in two ways: "(1) the use of technology to help ensure the student's course of study is more tailored and even curated to their interests, experiences and skills, and (2) our ability to determine mastery or accomplishment of the educational goals based on factors other than GPA, contact hours and such aggregated measures." Soares described learning within a social context; he believes technology will "help colleges

create extended knowledge communities that include both high-tech and high-touch components." He mentioned Northeastern University's work on its alumni networks and said, "People need to be embedded in multiple communities that do occupation and career mapping and learning mapping."

Quality, accessibility, cost. To get to a future that advances all three, higher education will need to overcome both barriers and risks and avoid some wrong turns.

Silver Bullet or Tool?

Breaking the iron triangle is harder than it may seem, especially to institutional leaders whose expectations of technology are influenced by their uses of Amazon, Facebook, Apple, and Google. Futhey and Schroeder, both CIOs, see a tendency for non-IT leaders to view technology as plug-and-play simple (and, with wireless, even the plug goes away). Yet technology-enabled solutions don't happen without people, process, data, culture, and integrations. Futhey warned: "We need not to make the additional complexity the campus's problem but we need the campus to recognize that all these components are needed and will limit how quickly technology-enabled solutions will happen."

Smith and Soares warned against misconstruing technology as a panacea and against, as Soares put it, thinking that "IT is going to unilaterally solve a whole bunch of problems, from learning outcomes to college affordability. Digital textbooks are a good example, using OER." As in Soares's example, the reality is more complicated and plays out institution by institution and course by course.¹

Alexander considered the other end of the value spectrum and worries that to some leaders, information technology remains a utility that "misses the huge range of possibilities, human creativity, the multiple ways we learn, the real challenges and dangers we face. It's like thinking about a car as only about turning the engine on and off again. The tech takes you places, and that's what we really have to show people." Smith warned that a technology-as-tool perspective can cause leaders to overlook the ongoing costs needed to maintain and upgrade technology: "There's such a movement of things that you can't expect it to be a solid-state environment. Technology is more like a river, in that you can't step in that same river twice. Things change."

Higher education leaders' interest in technology is growing. IT leaders need to help them learn how to dream big and plan realistically.

Sobering Scenarios

Greater access and affordability and more meaningful learning are exciting potential outcomes. Yet as technology plays a more



By **SUSAN GRAJEK**

Higher education information technology is filled with rich and interesting jobs. Our interviewees' thoughts about the most exciting jobs in the higher education IT field include something for everyone:

- CIOs
- Analytics professionals, who provide the bridge between the data dashboard and the leaders using the data
- Enterprise architects
- Instructional designers and other professionals in centers for teaching and learning
- Security professionals

substantive role in higher education, it also risks changing our sector's impact and very nature.

Colleges and universities have traditionally encouraged open dialogue and discovery within a large and diverse community of students, scholars, and community members. As technology enables students to channel their interests more specifically, one risk is that, as Futhey cautioned, "we become more insular rather than more open. If we focus inward, we could further marginalize ourselves to those who aren't part of these communities." She added that information security concerns present another challenge to the willingness and ability of higher education to value openness.

AI may help students learn more quickly and completely. It may also shape exactly what and how we learn. Just as textbooks can be written from a point of view that elevates some perspectives and facts and ignores others, so too, Schroeder warned, can AI algorithms, "if not developed by an appropriately diverse workforce in that coding community, because algorithms learn from those who teach them."

Soares sees disruptors to the higher education business model. He observed: "The tech players are trying to create the integrated solution that is recognized by the market at a lower cost. The architectures outside can't deliver an unbundled solution that's as efficient as the internal bundled one. Those outsiders are still figuring out how to create an integrated delivery of credentials." Should they resolve that challenge, colleges and universities may face major, disruptive competition.

Achieving Brighter Futures

Higher education leaders' mindset and choices are shaping the future of their institutions—and thus of our entire industry. Alexander reminds us that the U.S. higher education system was largely built in the mid-20th century. Yet we are facing forward and moving ahead, and we must remember that. Smith warned: "We are overly nostalgic in higher education. Nostalgia is a prohibiting force for doing things." Technology is changing roles within our institutions, with initial changes to advising and teaching already visible. Smith envisions a potential unbundling of the professorial role, with more specialization and differentiation and an increasingly team-based approach to teaching, not unlike what has happened with healthcare.

Leaders of institutions with campus-based reputational roots may worry that an online strategy will change the very nature and quality of their brand. Yet Futhey sees an online strategy as a potential expansion, not dilution, of the brand: "If we aggregate the entire residential U.S. campus population and compare it with the online population, it's tiny. It's not at all realistic to pretend that we in higher education have some kind of monopoly on the smartest 18-to-22-year-old minds, let alone other age groups. If we can figure out how to bring that entire population into our community, it would strengthen higher education and reinforce the fundamental role of universities as the epicenter of learning, whether through geographic borders or the electronic community." Soares anticipates "an era of a lot of interesting creativity around the academic enterprise." In his mind, technology can best contribute by grounding investments in facilitating learning and focusing on "enabling learning-centered, knowledge-centered, and community-centered environments."

These environments are generating vast amounts of data, which needs to be harnessed to help students pursue their learning journeys and to help thoughtfully measure the impact of higher education. Schroeder advocates for a rethinking of the metrics being used to assess quality: "I think the increasing view of education as a transactional good has eroded some institutional leaders' freedom to pursue the kind of transformation that they would like to. If we want to see higher education transform into something that is oriented toward educating people at scale at a high level of quality, our current principle metrics of quality don't support that. They disincentivize institutions from going in that direction."

Metrics are important because they expose the implicit value that society assigns to higher education. Smith commented: "The biggest thing that I think will come into play again is this questioning of the public value of higher education. Is it a public good, or is it a private good? Who benefits from that? That goes to how it should be funded."

So much of getting the future "right" may boil down to timing. Futhey warns: "If we get too far out ahead of our vision of what our constituencies are ready to accept, then we're out too early." Yet if we wait too long, higher education may be defending itself against a crumbling public commitment and new alternative credential-delivery solutions. What can IT leaders do? They can stay aware of technology's potential and pathways, understand the business model and missions of higher education and how to apply technology to both, and learn how best to tell that story. ■

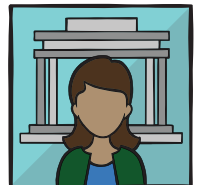
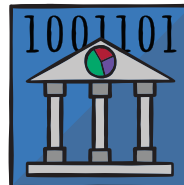
Note

1. Dian Schaffhauser, "Fixing the Textbook Model," *Campus Technology*, June 21, 2017; The Nielsen Company, "Textbook Trends: How U.S. College Students Source Course Materials," *Insights*, August 18, 2016.

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TOP 10 IT ISSUES 2018



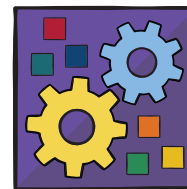
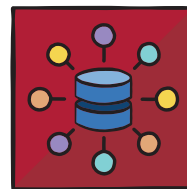
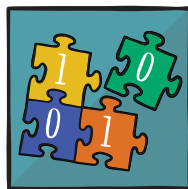
THE REMAKING OF HIGHER EDUCATION

Susan Grajek and the 2017–2018 EDUCAUSE IT Issues Panel

We have tremendous potential to realize in these coming decades If you look at complex dynamical systems, we're ... in an era of great breakdown, environmentally and socially and psychologically. And when systems break down, the ones who have the resilience to actually repair themselves, they move to a higher order of organization.

—Joan Halifax, Founding Abbot, Upaya Zen Center, Santa Fe, quoted in
“Compassion’s Edge States and Caring Better,” *On Being*, December 26, 2013

Information technology has broken through the silicon ceiling to gain the active attention of higher education leaders. The 2018 Top 10 IT Issues list¹ is a story of the convergence of higher education’s biggest concerns with technology’s greatest capabilities. The U.S. economy, politics, and technology are remaking higher education to a degree not seen since the middle of the 20th century, when the juggernaut that is the U.S. higher education system emerged from the country’s post–World War II ambitions for advancement, faith in science, and commitment to education and developed into a competitive advantage. The 21st century has seen those ambitions blunted, that faith questioned, and the commitment diminished. This century is also witnessing spectacular technology advancements that are reshaping every sector and influencing every demographic.



2018 Top 10 IT Issues

1. **Information Security:**

Developing a risk-based security strategy that keeps pace with security threats and challenges



2. **Student Success:**

Managing the system implementations and integrations that support multiple student success initiatives



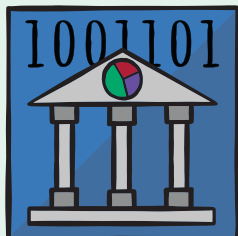
3. **Institution-wide IT Strategy:**

Repositioning or reinforcing the role of IT leadership as an integral strategic partner of institutional leadership in achieving institutional missions



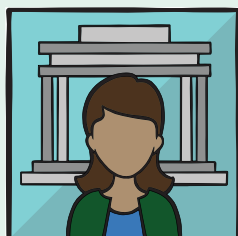
4. **Data-enabled Institutional Culture:**

Using BI and analytics to inform the broad conversation and answer big questions



5. **Student-centered Institution:**

Understanding and advancing technology's role in defining the student experience on campus (from applicants to alumni)



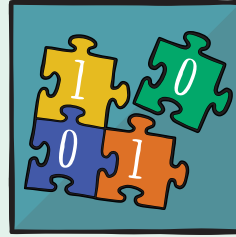
6. **Higher Education**

Affordability: Balancing and rightsizing IT priorities and budget to support IT-enabled institutional efficiencies and innovations in the context of institutional funding realities



7. **IT Staffing and Organizational Models:**

Ensuring adequate staffing capacity and staff retention in the face of retirements, new sourcing models, growing external competition, rising salaries, and the demands of technology initiatives on both IT and non-IT staff

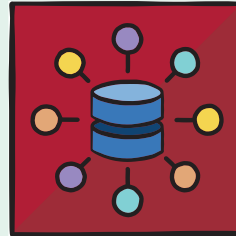


8. **(tie) Data Management and Governance:**

Implementing effective institutional data governance practices

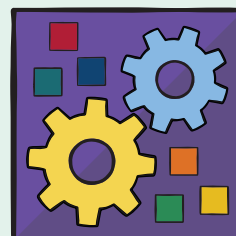
8. **(tie) Digital Integrations:**

Ensuring system interoperability, scalability, and extensibility, as well as data integrity, standards, and governance, across multiple applications and platforms



10. **Change Leadership:**

Helping institutional constituents (including the IT staff) adapt to the increasing pace of technology change



Regardless of technology, the historical business models in use today across higher education will likely need to change. Higher education is headed toward something new: perhaps brighter, perhaps darker, or maybe just different. Technology simply—well, not so simply—introduces what may be a more extreme set of potential futures on both the utopian and the dystopian ends of the spectrum.

Technology has often served as a backburner activity at many higher education institutions. The IT director would be called in to the president's office to defend the growing IT budget, to explain the cause of a major data breach, and (less commonly) to advise on strategy. But in recent years, and with increasing magnitude, information technology has had other impacts on the institution—ones potentially more profound and beneficial than a noticeable slice of the budget or an ongoing source of risk.

- Faculty at eight universities participating in the Association of Public and Land-grant Universities (APLU) grant program *Accelerating Adoption of Adaptive Courseware at Public Research Universities* are combining several

new technology-enabled advances in learning—adaptive courseware, active classroom learning, and active classrooms—to focus classroom time on students' particular learning challenges or interests instead of one-size-fits-all lectures.²

- Arizona State University is incorporating voice technology into engineering students' residential community and their curriculum, to give them a unique opportunity to use their living experiences to improve their learning, and vice versa.³
- Ramapo College redesigned its advising services and augmented them with early-alert technologies to improve the retention rate for transfer students from 78 percent to 85 percent.⁴
- Virtual reality and related technologies are transforming science and science education by introducing discipline-specific simulation labs that accelerate learning and experimentation at much lower costs.⁵
- Georgetown University is among the institutions piloting digital storytelling, which uses multimedia to turn classrooms "into spaces of creative critical multimedia production,"

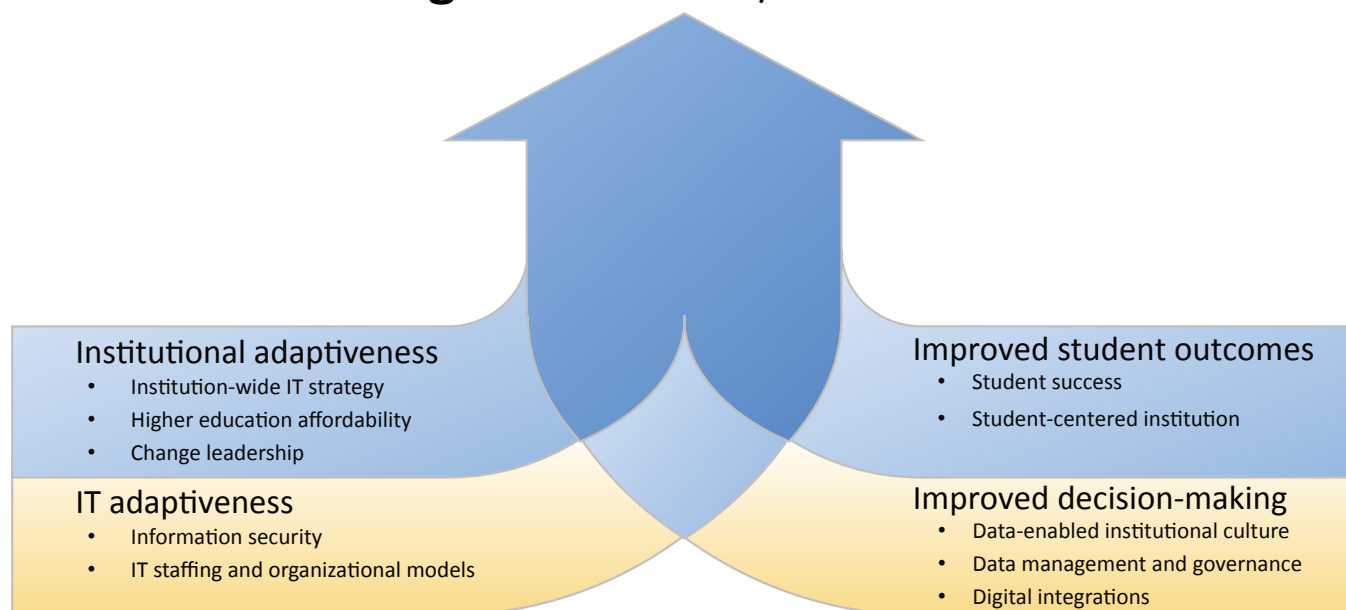
enhancing traditional scholarship and writing.⁶

The *American College President Study 2017*, from the American Council on Education (ACE), is largely focused on presidents' characteristics and their perspectives on funding, diversity and inclusion, and other issues. But the authors advise presidents to pay more attention to technology, particularly to "using analytics functions to make better decisions and leveraging technology to scale out quality, cost-effective best practices."⁷ The presidents and boards that "get IT" may very well be those presiding over the institutions that will be most successful in the coming decades.

Last year's Top 10 IT Issues concentrated on IT investments and activities around one particular strategic issue: student success. This year the story is about the broader strategic impact of technology on the entire institution. The focus of information technology in higher education for 2018 is on *remaking higher education*, through four primary themes:

- *Institutional Adaptiveness*: Institutional and IT leaders are strengthening their

Higher Education, Remade



individual and collective capacity for not only effective and efficient, but also consequential uses of technology.

- **Improved Student Outcomes:** Work on student success initiatives has become both more tactical, with a nuts-and-bolts focus on integrations, and more aspirational, with a new emphasis on students' entire experience with the institution.
- **Improved Decision-Making:** The data issue is every bit as complicated as has been predicted, and efforts to gather, manage, and use the data are advancing.
- **IT Adaptiveness:** IT organizations are adapting themselves to new economic, demographic, and industry models and realities and are approaching the information security of the institution with even greater rigor.

College and university leaders have become more realistic as they have gained more experience with what it means to use technology and data to improve institutional efficiency and to transform the student learning, completion, and social experience. As an industry, higher education has moved beyond the ideation phase of the early adopters and pilots. Real lessons will be learned this year, real money will be spent, and real progress will be made.

Institutional Adaptiveness

Three of the Top 10 IT Issues represent the theme of *institutional adaptiveness*:

- #3. **Institution-wide IT Strategy:** Repositioning or reinforcing the role of IT leadership as an integral strategic partner of institutional leadership in achieving institutional missions
- #6. **Higher Education Affordability:** Balancing and rightsizing IT priorities and budget to support IT-enabled institutional efficiencies and innovations in the context of institutional funding realities

#10. **Change Leadership:** Helping institutional constituents (including the IT staff) adapt to the increasing pace of technology change

Today, any successful institutional strategy must have a digital footprint. Technology's capabilities and costs need to be integrated into institutional strategy. If that is to happen, IT leaders and institutional leaders need to develop a much deeper and stronger mutual understanding. CIOs need to understand how to talk about technology in the language and context of education, research, administration, reputation, and risk. Presidents and provosts need to learn how to ask IT leaders the right questions about potential IT investments; CBOs need to help their institutions manage technology investments in addition to technology budgets; and boards need to ensure that technology is treated as a risk and a risk mitigator, as a capital investment, and as an agent of institutional transformation.

This is all very exciting. And very expensive. There aren't enough dollars in any institutional budget to fulfill every technology-enhanced dream. Technology may someday make a postsecondary credential more affordable, but achieving lower costs will be paradoxically pricey. Choices must be made. The best choices happen when institutional and IT leaders collaboratively develop investment priorities and take a portfolio-based approach to technology spending.

If technology comes with one guarantee, it is that technology will never cease to change, which means that people will need to continually adapt to new features, new processes, lost ("upgraded") functionality, and the outages most commonly caused by change. There's good news this year, though: institutions are paying serious attention to change. Change that is well managed and well led is much more likely

to be beneficial and accomplished more quickly. Whether institutions apply formal frameworks (e.g., the Kotter 8-Step Process⁸) or generic best practices, more institutions are including change management as a component of new initiatives and organizational development.

Improved Student Outcomes

Two issues emphasized *improved student outcomes*:

- #2. **Student Success:** Managing the system implementations and integrations that support multiple student success initiatives
- #5. **Student-centered Institution:** Understanding and advancing technology's role in defining the student experience on campus (from applicants to alumni)

Higher education institutions have gained considerably more experience in student success initiatives over the past year, with 74 percent incorporating a student success focus into their IT strategy—a 6 percent increase from last year.⁹ The related issues on the 2018 Top 10 IT Issues list demonstrate a recognition

that the data needed to improve *Student Success and Completion*, issue #2 on last year's list, does not reside in one application. Student success is a constellation of processes, experiences, and outcomes that are not going to be addressed by one

single student success system—eager vendor promises to the contrary. The data needed to achieve an institution's student success ambitions lies in multiple forms in multiple systems. This year's work concentrates on deciding which of those systems can best fit the institution, on implementing them, and then on

Real lessons will be learned this year, real money will be spent, and real progress will be made.



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The EDUCAUSE IT Issues Panel comprises individuals from EDUCAUSE member institutions to provide feedback to EDUCAUSE on current issues, problems, and proposals across higher education information technology. Panel members are recruited from a randomly drawn and statistically valid sample to represent the EDUCAUSE membership.

integrating those systems to deliver the experiences and data needed.

One of the most exciting additions to the 2018 Top 10 IT Issues list is the *Student-centered Institution*. This issue is exciting because it demonstrates a comprehensive application of technology to higher education's most important constituent: the student. This is technology at its boundary-blurring best: moving beyond a point-in-time, functional consideration of the student as an applicant or as a registrant or as a learner in a course or as a commuter or as a dorm resident or as a graduate, toward—potentially and

hopefully—as *all of these*. This is technology moving beyond configuring tools and systems to *optimizing users' experiences and outcomes*. This is technology that is holistic and design-centered.

Improved Decision-Making

Three issues this year relate to the theme of improved decision-making:

#4. *Data-enabled Institutional Culture*: Using BI and analytics to inform the broad conversation and answer big questions

#8. (tie) *Data Management and Governance*: Implementing effective institutional data governance practices

#8. (tie) *Digital Integrations*: Ensuring system interoperability, scalability, and extensibility, as well as data integrity, standards, and governance, across multiple applications and platforms

Decision-making is just a means to an end, and data is just a way to improve decision-making. That separates data by several degrees from what really matters about higher education: whether and

how students learn, how education can improve students' lives and our society, how faculty produce and disseminate knowledge, and how that knowledge can improve and advance the world and its denizens. And yet decisions are choices, and choices have consequences. For higher education institutions and their students and faculty, those consequences are life-changing. The use of data is thus quite complex, as IT professionals and their institutional partners are learning.

Historically, we have not fully leveraged the value of the data in our systems. As higher education professionals recognize data for the raw asset it is, they are faced with a set of complexities that occupy almost one-third of the Top 10 IT Issues list this year. Data doesn't manage itself. The work of data management and governance is political as well as technical. The data formats and definitions that effectively answer one set of questions about faculty fall far short in addressing another set of questions about faculty. Institutions are finding it extraordinarily difficult to simply discover all the pockets of data and the ways data is being used to manage daily and strategic choices.

Technical challenges pertain to sharing and integrating data across the multiple systems developed and configured at different times by different vendors and stakeholders. Even that highly technical effort can become political, as questions about a primary data source, conflicts about who can see and alter what, and issues of data integrity must be addressed and resolved.

All of this work is needed to be able finally to incorporate data into ongoing decision-making, which brings its own set of challenges. Over and over, the EDUCAUSE IT Issues panelists stressed the importance of starting with clear questions that will truly inform decisions, of using basic analytics to gain experience, and of helping decision-makers and analytics users gain facility with the process of data-informed decision-making.

Top 10 Strategic Technologies and Trends

The EDUCAUSE Top 10 IT Issues research is complemented by the EDUCAUSE Center for Analysis and Research (ECAR) *Higher Education's Top 10 Strategic Technologies and Trends for 2018*. The strategic technologies and trends report provide a snapshot of the relatively new technological investments on which colleges and universities will be spending the most time implementing, planning, and tracking, as well as the trends that influence IT directions in higher education. Those interested in a deeper dive into teaching and learning can consult the EDUCAUSE Learning Initiative (ELI) Key Issues for 2018. Collectively, the trends and forecasts reported in the Top 10 IT Issues, Strategic Technologies and Trends research, and ELI Key Issues help IT professionals and institutional leaders enhance decision-making by understanding what's important and where to focus.

IT Adaptiveness

Two issues encompass the fourth theme, IT *adaptiveness*:

- #1. *Information Security*: Developing a risk-based security strategy that keeps pace with security threats and challenges
- #7. *IT Staffing and Organizational Models*: Ensuring adequate staffing capacity and staff retention in the face of retirements, new sourcing models, growing external competition, rising salaries, and the demands of technology initiatives on both IT and non-IT staff

Information Security is the #1 IT issue in 2018. As it was in 2017. And 2016. This high-stakes whack-a-mole game demands constant institutional attention. The Equifax breach occurred in the middle of our Top 10 IT Issues data collection. We looked but found no measurable influence on the issue's importance. It was tracking as #1 before, during, and after news of the breach broke. That's how consequential this issue is for higher education.

The stakes are growing, as are the threats, and also the investment needed to avoid catastrophe. It is no wonder

this remains the top issue for the third year in a row. Yet information security is not a risk that can be contained to technology operations alone. As comments from members of the EDUCAUSE IT Issues Panel point out, information security risks are strategic risks to the institution. They require a comprehensive, enterprise risk management (ERM) approach in order to be effectively addressed.

The IT profession is undergoing its own remaking that is every bit as monumental as higher education's. The economic and political pressures on higher education have been placing constraints on its IT workforce. Higher education is not as intrinsically attractive a place for IT staff to work as it once was, and there are many other options that offer higher salaries, more interesting and more modern challenges, greater professional development, and better benefits. IT managers are challenged on multiple fronts. They need to attract and retain the best talent. They need to adapt the existing workforce to new roles and techniques. They need to work with non-IT managers to enlist functional staff in the critical roles that these staff can play in new technology-related initiatives. The work won't get done without people, and the "people part" has become very difficult.



Issue #1: Information Security

Developing a risk-based security strategy that keeps pace with security threats and challenges

Daniel R. Drenkow,
Kathy Lang, Susan McHugh,
and Joshua Singletary

Information security is not just an IT risk, it's a risk to the institution. The risk is multidimensional—financial, reputational, mission-based—affecting all areas and all individuals. The compliance environment is becoming more complex by the day, and so are the risks. Desktop-level risks that were so worrisome in recent years are going unmitigated as attention shifts to turnkey solutions that are now managing a lot of critical business functions. Recent standard solutions—such as running a penetration test or posting policies—provide little protection or even comfort in today's environment. The problem is infinitely scalable for the biggest institutions and very difficult to reduce for the smallest.

The key word is *practical*. In a period where powerful, ready-to-launch platforms and tools exist alongside the traditional enterprise and unit-level

enterprise products and process, what is a practical information security framework that is accessible to all institutions of all sizes? This is a question with no easy or stable answer.

Who Outside the IT Department Should Care Most about This Issue?

- The CFO, who will have to manage financial risks
- The marketing team, to safeguard the institution's reputation and tell the accurate story
- The general counsel and the risk officer, to establish and monitor risk and compliance thresholds
- The board and the president, to understand the magnitude of the risk and determine the institution's approach
- The president and the provost, because they are going to get calls from students, parents, the press, and others after a breach
- Advancement, research teams, admissions, and anyone who deals with customers. Students, parents, and other partners have more exposure to these issues now than at any other time. They are watching, and the wrong incident at the wrong time can affect decisions to apply, attend, fund, or donate.

The Misconceptions

- One set of best practices can get all institutions to a better information security posture. (A one-size-fits-all model for risk-based approaches/strategies will not work.)
- The IT department can, with enough funding and enough investing in enough tools, prevent all the risks. (This simply is not the case. Investing in tools can reduce exposure to risk, but it is impossible to eliminate all risk.)
- This is an IT issue. (Information security is everyone's responsibility. Many incidents stem from end-user behavior. Training is at least as important as technology in managing the information security risk.)

The Pitfalls

- Insufficient in-house expertise, funding, or leadership support can increase institutional exposure. This is especially difficult when funds cannot keep pace with funding needs. Investing in security after a major breach—which so often happens—simply increases the cost of information security because responding to major breaches is very costly.
- Balance is important. Take care not to overinvest in identifying risks only to run out of funds to mitigate

“This is a swimming pool with no shallow end. Security professionals excel at identifying and offering mitigations for information security risks. But the sheer volume of mitigation tasks leaves smaller institutions overwhelmed: Having already consumed significant resources just to identify risks, small schools struggle to find a sustainable pathway forward.”

—Joshua Singletary, Chief Technology Officer,
Albany College of Pharmacy and Health Sciences



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them or to overfocus on one area at the expense of another. Do the most you can to mitigate the risks without ignoring one area over another.

- It's easy to believe that breaches are things that happen at other institutions—until one happens to you. It's no longer a matter of whether a breach will happen; it's a matter of when.

The Opportunity

Institutions that adopt an effective and enduring risk-based information security strategy are those able to embed compliance at the enterprise level and the unit level. Compliance stops being a barrier and increases efficiency. The entire institution becomes more knowledgeable about threats and threat assessments and has plans in place to deal with those threats.

Advice

To get started:

- Pick a framework to follow (e.g., the CIS Controls or the NIST Cybersecurity Framework) to set a baseline for where you are and to plan for how to improve within the chosen framework. The framework helps you consider your entire environment.
- Join information security groups such as those offered in the EDUCAUSE Cybersecurity Program to share information and learn from others.
- Have a philosophy for how to address problems with scale before you overcommit your resources. Form a team, ideally including multiple stakeholder areas, to create and rehearse a response for information security incidents.
- Institute a year-round campus-awareness campaign to educate your community. EDUCAUSE awareness materials can jump-start this effort.

To develop further:

- Assess whether or not the approach that you began with was designed to accommodate the changes we are seeing now. Is it intentional about what



Tools for Better Decision-Making

Campus leaders use the Top 10 IT Issues to inform their strategic planning. EDUCAUSE has additional tools to enhance decision-making. The Core Data Service is an assessment and benchmarking service that helps leaders and managers plan for and manage IT service delivery; financials; information security; governance, risk, and compliance; technology-supported learning; and digital capabilities.

was deferred or omitted from the strategy? Does the strategy have a holistic or team-based aspect to can help address the gaps?

- Begin continuously educating your constituents about information security. The content needs to be timely and relevant to maintain community attention.
- Continually review policies, content, and strategies to stay abreast of current threats and mitigations.

To optimize:

- Use the fact that security is a strong strategic risk as an opportunity to elevate information technology as a strategic asset.
- Learn from industries outside higher education. Sometimes they have ideas that we may not have considered. Look at their best practices.
- Share your knowledge by conducting peer reviews and by writing and presenting to help others.
- Consider an approach that can be

baked into the institutional culture and made part of everyone's job rather than a standalone monolith that must be cared for and tended by the information security officer.

Ecosystem Opportunities

Our ecosystem needs more shared approaches that can reduce the complexity of the solutions and are translatable to individual institutions. Shared approaches can be differentiated by institutional size, class, mission, and complexity. They also make benchmarking possible, which helps monitor progress and establish targets. The more institutions that follow the same path, the stronger we all become.

Many leaders really don't want to talk about information security. EDUCAUSE and other professional associations should find a way to convene and frame discussions to advantage sharing, understanding, and commitment across our sector.

(continued on page 24)



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The Third Time's the Charm?

Information Security at the Top of the List Again

Joanna Lyn Grama and Valerie M. Vogel, with Michael Corn and Sharon Pitt

For the third year in a row, *Information Security* tops the EDUCAUSE Top 10 IT Issues list. Only one other issue, *Sustainable Funding*, has topped the annual list more times in a row (a three-peat from 2003 to 2005 and again from 2009 to 2011).

We asked the co-chairs of the Higher Education Information Security Council (HEISC)¹ to reflect on the third #1 placement of Information Security on the EDUCAUSE Top 10 IT Issues list.

■ **Michael Corn**, Chief Information Security Officer, University of California, San Diego



■ **Sharon Pitt**, Vice President of Information Technologies, University of Delaware



Is it significant that *Information Security* is the top IT issue for the third year in a row? Why or why not?

Corn: I think it is significant. While colleges and universities continue to invest in information security, we security practitioners have failed to clearly define a strategy for cybersecurity, and thus our leadership feels “unmoored” in response to the public drama of large-scale data breaches. Thus, whatever the news of the day happens to be, we hear the constant question: “What are we doing in response?”

Pitt: Yes, it is significant. The continued appearance of this issue is a combination of our not yet having a handle on the issue as well as a changing and more sophisticated threat environment combined with increasingly demanding compliance responsibilities.

What is higher education, in general, doing well in the information security area?

Pitt: I believe we’re doing a great job of creating policy and of building awareness—in part because these are low-hanging and perceptually inexpensive fruits on the secure institutional “tree.” We’ve got a lot of people time—and that time can be repurposed toward building capability in areas that don’t require us to spend new dollars on security.

Corn: While each of our institutions has its own idiosyncratic strengths and weaknesses, collectively we’re exceptionally tuned to focus on high-value practices. Few cybersecurity programs can afford to be inefficient; thus we coalesce around effective technologies and practices, and our culture of information sharing (as exemplified in the EDUCAUSE HEISC program) can be seen as an emergent property of our collective practices.

How do data breaches such as the September 2017 announcement of the Equifax breach² impact higher education?

Pitt: That’s an interesting question. I believe people are more furious that Equifax executives may have benefitted personally from the breach than they are about the breach itself. We’ve almost become inured to breaches, in the sense that so many of us have experienced one in some form or another. Of course, the data stolen from Equifax (and from the U.S. Office of Personnel Management in 2015) will allow more-sophisticated phishing to take place. So, the onus for higher education is continuing to focus on security awareness training, as well as putting multifactor strategies in place to protect institutional (and, by extension because of good security practices, personal) assets.

Corn: My first thought was, why on earth do we keep apologizing for the state of information security in higher education when this one breach is probably fifteen times the sum total of all higher education breaches in aggregate? Individually, even the tiniest breach is a bad thing for our communities and reputations, but in aggregate, we’re a footnote. Still, the breach does underscore our role as research and teaching institutions and the as-yet-unmet need for better technical solutions and for more trained security professionals.

What is the top information security concern (strategic or operational) that keeps you up at night?

Corn: The world has been transformed by the easy exchange of information. We’ve crafted all these wonderful tools for sharing data, and it should come as no surprise that people use them—often inappropriately, from the security perspective. As security professionals, most of us have grown up in environments where we literally control the software ecosystem. Those days are long gone. Yet I’m not sure we’ve created a professional framework that makes sense in a contemporary IT ecosystem. The very vocabulary “security control” is beginning to feel like an anachronism.

Pitt: I’m sleeping well, thank you, but a big worry is the inevitable breach, because it’s an unknown. Will it be an internal or an external threat? Will our team be capable of handling



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the technology challenges associated with the breach? Will our institutional leaders keep their heads on straight and respond with aplomb and dignity? All of these are wildcards. The best that we can do is train, put procedures in place, and practice for the inevitabilities that we will never be able to specifically define but for which we can outline a broad “cone of impact.”

Institutions that face a breach are likely to take a big hit to their reputation based on how they respond to it. Look at Equifax: because of the manner in which the breach was handled—from executive mismanagement of information to the perceived inability to sue (and of course, the fact that the company is a credit bureau!)—its reputation has suffered.

What do you think small institutions struggle with the most in creating and maturing their information security programs?

Pitt: Prioritization, combined with growth capacity. With very limited funds, an institution can find it quite easy to allocate all resources toward one aspect of a security portfolio—and then be done, with no more resources to commit to security. Determining how to continually make progress, from year to year, toward a justifiable security stance is a huge challenge. Smaller institutions can take advantage of the many resources available from HEISC (e.g., security-awareness campaign materials, template policies, assessment tools), as well as explore innovative strategies to share security staff and security resources across institutions.

Corn: Scope. The portfolio of the security professional at Whatsamatta U with 500 students is almost the same as that faced by those of us at very large state schools. As Sharon says, prioritizing and being strategic on the small scale is really challenging. Fortunately, more and more smaller schools are finding creative ways to partner with others, and many security practices are now becoming cost-effective as vended services.

What do you think large institutions struggle with the most in creating and maturing their information security programs?

Pitt: Culture, although culture likely impacts institutions of all sizes. There is a tendency for IT staff to believe that security is the responsibility of the security operations team, rather than of all members of the IT staff. And of course staff such as device-support professionals, client-support professionals, and network professionals are all engaged in creating a justifiably secure technology environment.

Larger institutions may be more engaged in sponsored research than are smaller institutions (I realize this is a very stereotypical statement, since some smaller institutions are heavily engaged in sponsored research). This activity has its

own requirements around data loss protection and compliance. In the past few years, many of us at larger institutions have struggled with how to deal with export control and with the National Institute of Standards and Technology’s new requirements around research activity.

Corn: Culture. (You can see why I like working with Sharon.) But I have a different perspective on this. I see too many schools where the broader distributed IT culture is seen as a problem, rather than as the solution to many of our resource challenges. As is the case at many other institutions, at UC San Diego the central IT organization represents only around 25–35 percent of the full IT workforce. If I can support and empower that other 65–75 percent of IT staff so that they put merely 5 percent of their time into effective security practices, that’s a huge force multiplier for my office and the university.

What last piece of advice would you give to institutions as they consider their own information security programs?

Corn: Participate. Whether I’m working with the REN-ISAC (<https://www.ren-isac.net/>) or in one of the EDUCAUSE HEISC workgroups or discussion forums, I’ve always reaped much more than I’ve sown from participating.

Pitt: Breathe. It takes time to build mature capability in this area. You’re likely doing more than you think you are doing to invest in an appropriate security stance for your institution. ■

Notes

1. HEISC (<http://www.educause.edu/security>) supports higher education institutions as they improve information security governance, compliance, data protection, and privacy programs. HEISC publishes the Information Security Guide, which features toolkits, case studies, and best practices to help jump-start campus information security initiatives.
2. Voting for the EDUCAUSE Top 10 IT Issues was open from August 28 to September 17, 2017. The Equifax breach was announced on September 8. Our analysis shows that *Information Security* convincingly held the top spot in the voting on September 7. We observed negligible variations in the ratings given to *Information Security* after the breach announcement. Even in the days immediately following the announcement, respondents consistently gave ratings similar to those before the announcement. Thus, the Equifax data breach appears to have had no effect on the positioning of *Information Security* at the top of the IT Issues list for 2018.

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(continued from page 20)



Issue #2: Student Success

*Managing the system
implementations and
integrations that support
multiple student success
initiatives*

Ahmed El-Haggan, Jim Julius,
Vanessa Hammler Kenon,
and Richard Sluder

Student success, including persistence and completion, is at the core of higher education. To students and educators today, “student success” may encompass effective enrollment, on-time completion of educational goals, meaningful employment, and even preparation for good citizenship. Although by some measures completion rates have remained unchanged at many institutions for the past three decades,¹⁰ what *has* changed is the scrutiny of those rates. The future of individual institutions, higher education at large, and even our society is at stake.

Many institutions recognize that student success can and should be supported by the systems that students must navigate. We need good customer relationship management systems for

recruitment and enrollment, course management alert systems and learning analytics for learning, class scheduling systems for registration, class scheduling analytics systems to decrease time to achieve, and education planning systems for advising, course building, and credential management. A wide scope of analytics tools now permits risk prediction for student success/failure, process review including assessments for curricular and policy impacts, and workflow. Some of these are new applications; some are enhancements of existing systems. The IT contribution is not simply one of automation. It is the data these systems generate that offers the most promise to truly improve student success: data about how students learn, how they navigate individual courses and entire curricula, which extracurricular activities they engage in, which interventions are most effective and when, and more. All this data requires integration and analysis, as well as effective and timely reporting, visualization, and other methods to put the right information into the right hands at the right times.

Today’s solutions are not holistic. They tend to address components of the student success challenge, making system integrations inevitable. Today’s solutions are still nascent, making ongoing reinvestments inevitable. Expensive, difficult, yet oh so promising—that is where we stand today.

The world is watching. Parents, students, boards, employers, donors, and the media are all aware of the completion issues and are asking for data, and many have revenue stakes. Institutions that are doing this most effectively involve everyone; the issue needs a collective approach. Technology alone won’t provide a solution, but no solution is possible without good technology.

Who Outside the IT Department Should Care Most about This Issue?

- Presidents and boards, to ensure the future of the institution
- Provosts and other academic leaders, to help ensure faculty have the

resources they need to work with students

- Institutional research (IR) and operational excellence directors, to collaborate on data and reporting
- Registrars and advisors, to ensure solutions are useful and effective
- Students, who care a great deal about their success

The Misconceptions

- System implementations and integrations are primarily technology issues. (These projects must start with the people and the processes and then consider technologies.)
- The IT department is peripheral. (IT professionals often have a cross-institutional perspective that is unmatched and can “be the glue” to integrate not only data and systems but also cross-departmental business processes.)
- Faculty don’t need to be involved because student success is the purview of the IT or student services department. (The faculty-student relationship is core to students’ experience and therefore to student success.)
- Student success initiatives are another costly drain on institutional resources. (Although the work is expensive, if treated as an investment, student success projects help both institutions and students financially.¹¹)

The Pitfalls

- It is important to maintain a “one institution” approach, where all are working toward a common objective, and to guard against tendencies toward “siloing.”
- Lack of good project management discipline to facilitate shortcuts leads to significant failures. For example, leaders need to find a balance between an expansive vision and scope creep. Limiting the vision too much will lead to trivial results. Yet with scope creep, people become exhausted by multiple projects, and the initiative takes more time and money than intended.

“It has only been a few short years since advising and analytics platforms were initially launched. Since then, however, these technologies and the knowledge base have evolved tremendously. Accordingly, institutions that are just now getting started can expedite implementation, accelerate outcomes, and thus add value faster.”

—Richard Sluder, Vice Provost for Student Success and Dean of University College, Middle Tennessee State University

- It can be easy to exceed the institution's capacity for ongoing work and innovation. If “there aren't enough hours in the day” to do the work, either the work needs to shrink or the number of resources needs to grow.

The Opportunity

These initiatives ultimately force institutions to rethink and restructure what they do and to become better. By adapting to the student, today's student success initiatives are helping students who are not necessarily prepared to succeed in the traditional system. If done well, these initiatives raise the profile for the institution in settings beyond just the rankings in the *U.S. News & World Report*. Effective student success initiatives improve other processes and initiatives within the institution as well, all of which makes a difference in students' lives.

Advice

To get started:

- Learn from the pioneering institutions. EDUCAUSE has collected many resources to enable those just getting started to find helpful examples, advice, and even mentors.
- A student success initiative is a campus discussion that must have a strong executive sponsor. The project can

include the IT organization, but it must have a good sponsor to ensure a campus discussion. Schools experiencing success all have multi-level, engaged leadership.

- Stay vanilla with implementations. Stick to something simple. Be sure you have good project management and a reasonable timeline, and stick to your critical path.
- Governance is very important and should include faculty. The IT work should always be seen through the lens of the larger student success efforts—not as “just another technology project.”

To develop further:

- Keep the momentum going by recognizing early successes.
- Be careful to not add too many more tools when you are in the middle of the project. This can be confusing,

especially after initial buy-in from your users. These projects are evergreen, and the tools will always be changing, so you need to pace yourself.

- Emphasize the need to stick to the core strategic initiatives. There is always evolution, change, and upgrading too. Stick to the core and always come back to it.

To optimize:

- These projects never end. The work you do today is going to be the story you will be telling next year.
- Always be mindful of the next big lift—the areas that seem to produce the biggest return on investment without overloading the institution or leading it down an unintended path.

Ecosystem Opportunities

We learn from each other. Sharing success stories and the lessons learned through EDUCAUSE and other professional associations can help others be successful. Leaders who have developed open-source initiatives or have found foundations to fund student success should help their colleagues take advantage of these opportunities.

People pay attention to what is measured, especially when there is focus and accountability tied to it. Existing measures (e.g., IPEDS data) don't provide the data needed to adequately measure student success and outcomes. It might be beneficial to have a common data measurement system and create a standard way to measure student success performance management.

(continued on page 28)



Teaching, Learning, and IT Issues: Points of Intersection

Malcolm Brown and Veronica Diaz

Comparing IT and teaching and learning (T&L) perspectives on key issues is a bit like looking at a mountain from different perspectives: the mountain is the same, but it will look different if you're observing it from the north face or the west face. The "mountain" in question here is higher education, and the "faces" are the EDUCAUSE Top 10 IT Issues and the EDUCAUSE Learning Initiative (ELI) Key Issues in Teaching and Learning surveys. Since 2011, ELI has been surveying the wider teaching and learning (T&L) community, which includes all campus units that support the academic mission of higher education, including centers for teaching and learning, the IT organization, the library, and the dean and provost offices. Similarly, the Top 10 IT Issues survey is developed by a panel that includes IT and non-IT leaders, CIOs, and faculty members; it is then voted on by EDUCAUSE members. Together, the annual results of these two surveys provide perspectives that are complementary in nature, making it useful to closely examine the points at which they converge.

This year, there are important points of intersection: information security, student success, institution-wide IT strategy and digital integrations, and academic transformation. Indeed, we can see further intersections no matter the direction in which we look. For example, the issue of *Data Management and Governance* (#8, tie) is not just about learning analytics, but also about learning data standards. In what follows, we will highlight some of the more notable intersections, with the caveat that the intersections of IT and T&L issues are more abundant than space allows us to describe.

Information Security (#1)

Information Security is once again the top issue for the IT community—and with good reason: it's a major and unrelenting challenge for all of us. Until now, the T&L community has been a sympathetic observer and supporter of the IT organization's information security efforts. But in light of recent developments (e.g., the massive data breaches at Equifax and Yahoo), this is now an important issue for T&L as well. With the advent of open standards for learning data, all learning applications can now contribute data into a centralized aggregation point (sometimes called a *learning record store*). But with more data comes more responsibility, and this development has heightened awareness in the T&L community about both security and privacy. As progress is made in using open standards to architect new digital learning environments, T&L will need to partner closely with the IT organization in the ongoing pursuit of information security. Education about information security will now need to be a component of faculty development efforts.¹ But also emerging within the T&L community is a renewed concern about student privacy, a concern driven in part by the anticipated impact of the learning data standards. New approaches to privacy have surfaced (e.g., the Data Use

Label proposed by the IMS Global Privacy and Security Task Force), as well as possible ways to automate privacy vetting.²

Student Success (#2)

The Top Ten IT Issues and the Key Issues in Teaching and Learning surveys are reflecting institutional efforts to reorganize resources and evolve initiatives to support student success in more effective and collaborative ways. In the 2016 Top 10 IT Issues, *Student Success: improving student outcomes through an institutional approach that strategically leverages technology* ranked #3. In 2017, *Student Success and Completion: effectively applying data and predictive analytics to improve student success and completion* ranked #2. And in 2018, *Student Success: managing the system implementations and integrations that support multiple student success initiatives* also ranked #2 but was joined by *Student-Centered Institution: understanding and advancing technology's role in defining the student experience on campus* at #5. In the Key Issues in Teaching and Learning survey, *integrated planning and advising systems for student success* first appeared in 2014 and has been ranked in the top 20 ever since. However, the Key Issues survey includes additional student support elements: learning analytics, assessment of learning, adaptive teaching and learning, and competency-based learning. Something perhaps not evident in the surveys is the way that these technology-enabled supports are becoming integrated and how the institutional units (including the IT organization, academic affairs, institutional research, and student affairs) that support these areas are also collaborating toward a common goal. Some of the technologies and systems that support student success have matured over the past twelve months, but higher education is also learning about effective change management, leadership practices, and organizational models that support the learner in a holistic way.

Institution-wide IT Strategy (#3) and Digital Integrations (#8, tie)

In the *Digital Integrations* section of the 2018 Top 10 IT Issues article, the authors write: "The age of the ERP (enterprise resource planning) system is ending. Institutions are moving to enterprise architectures based on multiple products."³ This shift mirrors, fairly precisely, a development on the T&L side: the concept of the next generation digital learning environment (NGDLE). The NGDLE entails a movement away from overreliance on a single LMS toward an architecture based on a confederation of various learning applications, tools, content, and resources. At the heart of the NGDLE concept is the idea of integration via open standards. The IT and the T&L visions are thus fairly congruent: integrating disparate applications so that they offer our communities a consolidated environment and more customizable functionality. These are invigorating and also daunting challenges.

The good news on the T&L side is that open standards, when implemented widely, do work. The IMS Global standard



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These points of intersection represent areas of strategic overlap and consensus between the IT and the teaching and learning communities, revealing areas where the institution's internal units need to come together to be successful.

LTI (learning technology integration) has proven to be an effective and cost-efficient way to integrate disparate learning applications. As already mentioned, learning data standards (e.g., Caliper Analytics and Experience API) offer similar potential. And there are conversations under way about additional standards that relate directly to T&L areas of interest, such as digital badging and credentialing, transcripts, and assessment. This experience has shown that the ideal of integrating diverse applications into a unified architecture is no pipe dream but is, rather, a very real possibility. Due to this alignment, we expect that there will be many important opportunities for enterprise IT and T&L professionals to find common ground on future architectures for all of our digital environments.

Academic Transformation (#3, #7, #10)

For the past six years, academic transformation has been among the top four issues for the T&L community. Similarly, the 2018 Top 10 IT Issues survey demonstrates the need for academic transformation support in various areas: #3, *Institution-wide IT Strategy: repositioning or reinforcing the role of IT leadership as an integral strategic partner of institutional leadership in achieving institutional missions*; #7, *IT Staffing and Organizational Models: ensuring adequate staffing capacity and staff retention in the face of retirements, new sourcing models, growing external competition, rising salaries, and the demands of technology initiatives on both IT and non-IT staff*; and #10, *Change Leadership: helping institutional constituents (including the IT staff) adapt to the increasing pace of technology change*. Today, success in academic transformation depends on a cohort of campus leaders committed to leveraging technology and effective pedagogical practices to attain strategic goals. The capability of organizational evolution and adaptation to better serve today's learner through new instructional models, new business models, and new student support models has been

slow to develop in higher education. An institution that employs some means of managing and supporting change, whether administrative or pedagogic, is more likely to succeed—protecting its resources, financial and human, and positioning itself in an educational ecosystem where changes are becoming more frequent and more pervasive. It's worthwhile to educate teams across an institution on how change management can provide support between the existing campus culture and a critical project.



These points of intersection represent areas of strategic “overlap” and consensus between the IT and the teaching and learning communities. They are significant in and of themselves, but also represent areas where the institution's internal units need to come together to be successful:

student success, IT strategy, digital integrations, and academic transformation. Our two surveys primarily represent the IT and teaching and learning areas, but collaboration with other areas, such as institutional research and student services, is equally important. Indeed, our hope is that new models of collaboration will emerge in 2018 to further break down silos and fully enable student success. ■

Notes

1. Malcolm Brown, Jeffrey Pomerantz, and D. Christopher Brooks, “Educating Faculty about Information Security: Insights and Findings from ECAR’s 2017 Faculty Study,” *Transforming Higher Ed*, *EDUCAUSE Review*, October 23, 2017.
2. For further information, see “Naked in the Garden: Privacy and the Next Generation Digital Learning Environment,” *EDUCAUSE Review*, July 31, 2017.
3. Susan Grajek and the 2017–2018 EDUCAUSE IT Issues Panel, “Top 10 IT Issues, 2018: The Remaking of Higher Education,” *EDUCAUSE Review* 53, no. 1 (January/February 2018).

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(continued from page 25)



Issue #3: Institution-wide IT Strategy

*Repositioning or reinforcing
the role of IT leadership as
an integral strategic partner
of institutional leadership
in achieving institutional
missions*

Mark Roman, Katie Rose, and
Joshua Singletary

Information technology is a portfolio of investments designed to support achievement of the institution's goals and objectives. Prudent management of these strategic investments requires mindful strategic planning to deliver on the promise of the IT vision.

If institutions want to be more successful, get things done faster, and achieve the right solutions, then the IT department needs to be a partner with institutional leadership from the very beginning. At many institutions today, the IT department functions, or is at least perceived, as the gatekeeper to (and from) technology. That diminishes both the role and the scope of IT leadership, to the detriment of the institution's progress. Changing the role of IT leadership from gatekeeper to copilot can make the difference between an institution where

information technology is simply a toolbox and one where it is a strategic asset.

In complex institutions where IT systems, staff, and leadership are distributed, some degree of coordination is needed so that constituents can have a seamless experience, costs can be contained, and major institutional ambitions can be achieved.

In this world of consumerized information technology, where anyone at the institution can use a credit card to buy a cloud service, the ability to leverage the larger institutional buying power and to manage assets is lost. When the CIO and institutional leaders develop a strategy in partnership, the ensuing collaboration, coordination, and efficiency benefit the institution and all constituents.

Who Outside the IT Department Should Care Most about This Issue?

- Institutional leaders and board members, who need to understand how important technology is to the institution's future
- Business units, so they're all working together, not around each other
- Human resources (HR) and finance,

to coordinate and support cross-institutional IT investments and people

- The unit(s) responsible for compliance, because of the implications of cloud for compliance issues

The Misconceptions

- Existing process models—for process management, project management, change management, etc.—will work. (Business units who have been “given the keys to the kingdom” by purchasing their own vendor solutions can find centralized IT processes burdensome. The IT department needs to redesign processes that accommodate multiple equal and independent operators of IT systems and assets.)
- It's about the technology. (Today's top technology may soon become dated. IT leaders need to think less about technologies and more about strategies, processes, and how to change the culture and way of thinking at the institution.)
- An institution-wide IT strategy is about IT control. (It's about making the best use of the very finite resources—

“Our institution-wide IT plan deliberately aligns with the institution's mission. Since it is structured around three pillars of research, education, and community, everyone can see themselves in the plan. This approach creates a heightened opportunity for stakeholders to engage deeply with the IT organization in understanding how information systems directly impact the institution's goals.”

—Mark Roman, Chief Information Officer,
Simon Fraser University



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whether funding or people—of the institution. An institution-wide IT strategy helps constituents make choices to better achieve their goals.

The Pitfalls

- Local IT and enterprise IT units are two sides of the same coin. Don't be drawn into a debate that polarizes these groups. All IT contributors need to work together seamlessly to achieve the vision of "One IT." This approach will create an institution-wide strategy, not just a strategy for the "enterprise IT" department.
- There will always be little niches that need to be met in a different way. Use conversations with stakeholders to identify those niches, focusing on meeting the institution's needs.
- Be mindful of bureaucracy. It is easy to overengineer projects and processes. Focus on developing simple

building blocks, and don't let process get in the way.

- Enterprise IT and local IT units have different reporting and funding models. If you don't address this issue head on, it is going to trip you up. The local IT unit can provide great service and localized specialization, whereas the enterprise IT unit can provide great single services. To deliver on strategy, both are needed.

The Opportunity

When stakeholders and constituents buy in to an institution-wide IT strategy, it starts to affect decision-making at all levels. People start to engage with IT leaders in understanding the business goal and how the IT organization can support it. If the institution and IT leaders make the shift from the "IT department as gatekeeper" to the "IT department as copilot," this can provide

a great opportunity to embrace an entrepreneurial spirit, serving as the onramp to using digital technologies to remake higher education.

Advice

To get started:

- Consult stakeholders deeply and broadly, so that everyone feels they've contributed to the institution-wide IT strategy.
- Create IT department core values that align with the role of information technology and the institution's needs.
- Avoid surprises. Be open and transparent about the activities and priorities of the IT department and about challenges to information security, costs, and so forth.

To develop further:

- Think about whether you've given IT staff a genuine opportunity to reach out on their own. Or are they under the impression that they're limited by an unspoken boundary? This is sort of like friendliness in a framework. Make sure you're out there, all the time, ensuring that your customers are in good shape.
- Apply project management discipline to monitor the status of the relationship and the IT department's contributions.
- Constantly build and nurture relationships. Ensure that IT staff understand what business partners need and do, and ensure that institutional constituents understand the effort and risks entailed in running IT services.

To optimize:

- If everything is running smoothly, take the opportunity to simplify. Optimization is an ongoing activity and needs to become an organizational mindset.
- Have an IT strategy that mirrors the institutional strategy so that everyone can see the direct link between



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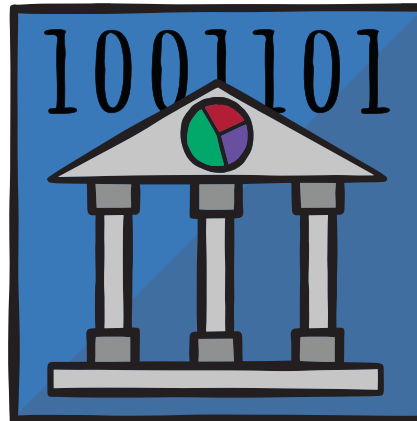
what the IT department is doing and what the institution needs. Consider having mission-based IT functions, as well as underlying functions (e.g., minimizing the administrative burden, developing a digital strategy, nurturing people) that clarify the IT organization's contributions to institutional priorities.

Ecosystem Opportunities

Today, every organization is arguably a technology company simply because of the sheer ubiquity of information technology. This new reality requires higher education institutions to understand this applies to them as well; if not, they risk losing relevance. The higher education CIO is in a unique position to lead this change. Higher education needs a greater recognition of what the CIO role can be and how that role can contribute to the college or university.

Higher education is inseparable from information technology, and IT leaders need to be embedded in the leadership and the ongoing business of the institution. Students use technology the minute they encounter an institution; faculty use various teaching and learning, outcomes, scholarly, and research technologies; and administrators are technology driven as well. Technology is a major component of what we do. Awareness of technology's essential role in higher education, and of the implications for higher education, needs to be raised on a national level.

There is an interesting opportunity here for IT organizations to partner with other groups that focus on different aspects of the higher education experiences (e.g., NACUBO, ACE, CLIR, CUPA-HR, AIR). If we could bring all the best minds together, we might be able to come up with a framework and roadmap for the "next big thing" in higher education. We would also have a better understanding of the needs of CBOs, presidents, librarians, and other non-IT leaders in the next five to ten years.



Issue #4: Data-enabled Institutional Culture

*Using BI and analytics to
inform the broad conversation
and answer big questions*

Sharon E. Blanton,
Ahmed El-Haggan,
Landon K. Pirius, and
Patricia A. Schoknecht

In a world of scarce resources, fierce competition, and increasing calls for accountability in higher education, institutions need to adapt. We can no longer afford to let intuition and rhetorical prowess drive decisions or let anecdotes serve as the primary method to communicate outcomes and progress. If institutions are to survive in the current world, they will need to have clear and measurable goals, which require data. Higher education has to become comfortable with BI (business intelligence) and data analytics to inform decisions, diagnose issues, and guide choices. In order to know where we might go as an institution, we need to know where we have been and where we are right now.

Higher education is in the early stages of using data to inform decision-making. Institutions need to develop

a broad awareness to ensure people that from all departments are thinking about what data is important to collect and how to collect it (e.g., data standards) to answer institutional questions.

Leadership sets the tone and can advocate for a data-enabled institutional culture that guarantees data and analytics are suitably accessible and are used to inform the broad conversation, support organizational learning, and answer the institution's strategic questions. Such questions include the following:

- Who are our best prospects?
- Why do we want them?
- Where will we find them?
- How can we attract them?
- When will they come to our institution?

Who Outside the IT Department Should Care Most about This Issue?

- Institutional leaders, to tell the institutional story well and to counter those who question the value of higher education
- Institutional Research and Institutional Effectiveness staff, to ensure data accuracy and useful insights
- Faculty, so that they have the right data (and access and tools) at the right time and thus can participate fully in decision-making

The Misconceptions

- Data will decide. (The data provides only the information. It is up to decision-makers to review the data, discuss the implications, and make the decisions. Data doesn't always guide leaders to a clear answer, but it can point discussions in the right direction. Data brings information; humans provide the context.)
- The existing data is sufficient to engage in analytics. (Most systems today were established simply to facilitate transactions, not to form the basis for analysis. Data standards for analytics and BI are more rigorous.

Effective analytics requires establishing strong data foundations, which takes time and effort.)

- Anyone can take the data and make sense of it. (Interpreting data effectively requires a lot of training, skill, and understanding.)

The Pitfalls

- This issue is not just about good data; it's also about good questions. Poor questions yield poor answers and waste resources.
- Analysis paralysis is a big problem (especially for institutions starting out), as is demanding perfection from real-world data. Too much time can be spent arguing about where to start. Decision-makers need to know when something is "good enough." If a report is created in a new reporting system, and the results are off by a couple of points from the old system, some naysayers will declare the whole project "bad."
- Don't buy a truck to move a matchbox. Scale the solution to the problem to avoid overspending on something that is of limited value.

The Opportunity

Institutions that are successful using BI and analytics to inform the broad conversation and answer big questions can improve student completion and persistence, contain or reduce tuition costs, and remove barriers to access to higher

education. They can become more efficient and make better use of their resources. Success may also open up grant and partnership opportunities.

Artificial intelligence (AI) is in the not-too-distant future for higher education. AI can enable institutions to provide faculty and students with adaptive and personalized resources for teaching and learning.¹² Analytics lays the foundation for success with this future differentiator.¹³

Advice

To get started:

- Do the foundational work, such as getting data into shape. Build encouragement of those efforts by starting with a small project that you can take to successful completion to show stakeholders why the foundational work is needed.
- Agree on certain guiding principles, such as using data for continuous improvement and performance development and not using it for punitive measures or for performance evaluation.
- Choose a user-friendly BI tool. Otherwise people will not use it.
- Don't start with predictive or prescriptive analytics. Master basic analytics and the issues that are of burning importance to your institution before evolving toward more advanced practices.

- Don't centralize the analytics functions in just one or two offices. Create a hybrid analytics organization that includes a very strong, highly qualified, analytics-trained staff in a central office and create center of excellences in different colleges and departments. Start small, and expand.

To develop further:

- Often these projects (and associated committees) tend to mushroom, and the teams get unwieldy. At some point you will need to develop governance that allows the teams to break off, work on smaller projects, and then bring those projects back to the larger group.
- Make sure the data that you use actually leads to better results and does no harm. Be thoughtful, and celebrate successes quickly. Show that there is a tangible payoff.
- The tool is important and so are the people who can use the tool. Teach people how to use the tools to avoid the capacity bottleneck that inevitably occurs when only one or two people are comfortable with the tool. People need to be able to keep the momentum going on their own.

To optimize:

- At some point you are going to discover institutional skeletons in the closet. You have to be prepared for difficult conversations, and you have to know what you are going to do about the act of "knowing" something actionable.
- You may need different tools to optimize, and this will be another cultural change for the organization.

"Our institutional president adopted a concept of data democratization. This is changing the culture of discussions between faculty and staff before decisions are made. She has really set the tone for transparency, lowered the walls of silos, and supported organizational learning."

—Ahmed El-Haggan, Vice President for Information Technology and CIO,
Coppin State University

Ecosystem Opportunities

High-level standards (analogous to IPEDS) could help institutions share the development process and learn from one another. Although each institution considers itself to be affording students with a unique experience, some retention and prospective student issues



(and associated metrics) are common to all institutions. A shared framework could allow colleges and universities to more efficiently and quickly contribute data and extract results. The time and money saved could make higher education more affordable overall.

The challenges of BI and analytics extend far beyond the IT and IR departments. The more broadly that higher education professional associations emphasize analytics and BI, the better. This should be a regular topic for boards, provosts, department chairs, and other institutional leaders.

Sharing best practices, logical data models, curricula, and expertise is critical. EDUCAUSE, AIR (Association for Institutional Research), and other organizations can use webinars and professional development to help drive momentum and build capacity for analytics.

(continued on page 38)

Enterprise IT Perspectives on the 2018 Top 10 IT Issues

Betsy Tippens Reinitz, with John Barden, Josie DeBaere, William Liddick, John Rathje, and David Weil

Each year, members of the EDUCAUSE Enterprise IT Program¹ Advisory Committee comment on the Top 10 IT Issues. This year, five committee members considered the challenges and opportunities presented by four data-related issues and the increasingly important role that data plays in higher education.

■ **John Barden**, Chief Information Officer, Yale University



■ **Josie DeBaere**, Director of Technology Architecture, Boston University



■ **William Liddick**, Interim Director, Engagement and Implementation, Ithaca College



■ **John Rathje**, Associate Vice Chancellor and Chief Information Officer, University of Arkansas at Little Rock



■ **David Weil**, Associate Vice President and Chief Information Officer, Ithaca College



Issue #2: Student Success

Managing the system implementations and integrations that support multiple student success initiatives

What are the biggest challenges for managing this issue?

Weil: We have a number of major initiatives that are part of our concerted effort around student success. The biggest challenge is ensuring that we look at these efforts from an enterprise perspective, instead of as a series of point solutions. Individual solutions can be quick wins (since they can often be implemented faster), but without a plan for how they will fit together, we don't get the full value from them. We must architect these implementations and our infrastructure to allow for the flow of data between initiatives in a way that permits us to have a full view of a student's activities and interactions with the institution. Investing the time to think through and develop an underlying enterprise architecture and associated tools is a key part of that work.²

Rathje: The most important challenge is alignment of institutionally defined success with system configuration and data flow. Bringing the right team together to define strategies and goals and to measure outcomes is also critical. Finally, continual improvement and system refinement for student success initiatives post-implementation can't be overlooked.

What are the biggest opportunities for this issue in the future?

Barden: Technologies are emerging that can enable a deeper student-advising role, moving away from "checking the box" of degree requirements to more

engaged relationships that are correlated with student persistence and progression. Making good use of these technology advances necessitates thinking less about tools and more about our institutional goals.

Weil: Given the many initiatives in this area, we have the opportunity to create a rich new set of information that we can use to improve student success and a student's engagement with us. There are already some institutions that are doing this very well,³ and they are seeing big gains in retention, graduation rates, and more personalized experiences for their students. In addition, if we make the right investments in our IT infrastructure and architecture—implementing tools and services such as integration platform as a service, a scalable enterprise data warehouse, and effective data governance—we establish an IT environment that is extensible and that more easily allows us to integrate and support new services down the road.

Rathje: With the future potential of billions of devices connected through the Internet of Things, significantly large (and currently unexplored) data correlations will present new opportunities for measuring student success. Data scientists will be in high demand, and those who can make well-advised decisions from their findings will help organizations not only survive but thrive.

Issue #4: Data-enabled Institutional Culture

Using BI and analytics to inform the broad conversation and answer big questions

What are the biggest challenges for managing this issue?

Rathje: The biggest challenges are developing the right data models, cleansing the data, harmonizing data between systems, and making tools available and easy to use. This takes strategic thought with unity of purpose, cooperation among key organizational units, orchestration between departmental systems, clear ownership regarding systems of record, and people who can aptly interpret results

from the business intelligence and analytic tools.

Weil: The most challenging piece of this isn't the IT part—it's the need to change the culture of the institution. Changing an institution's culture requires leadership from across the institution and at all levels—from the president or chancellor on down. It requires rethinking roles on campus and viewing data as an institutional asset. Some institutions are creating the position of Chief Data Officer.⁴ Others, such as Ithaca College, have created a Chief Analytics Officer to expand our understanding of the student experience, student learning outcomes, and student success and to lead efforts to develop data standards and work with a wide range of constituents to apply predictive analysis to inform our decision-making.⁵

What are the biggest opportunities for this issue in the future?

Barden: Breakthroughs in reporting and analytics are increasingly coming from interdisciplinary intersections. Most institutions have moved beyond basic questions that demand domain-specific data and are instead trying to answer questions that look across data families. These intersections often hold the key to answering more complex questions or the potential to predict how actions are likely to impact outcomes. This effort increases the demand for data governance to resolve data quality and data relationships in cross-

disciplinary structures that challenge traditional organizational structures and domain-specific solutions.

Rathje: Machine learning and artificial intelligence are opportunities for the future. Systems that learn about an organization and its data will help leaders refine their strategies. Organizations will be able to test possible solution paths before investing significant resources in one direction or another. Intelligent agents may recommend strategies that otherwise would have gone unrecognized.

Issue #8 (tie): Data Management and Governance

Implementing effective institutional data governance practices

What are the biggest challenges for managing this issue?

DeBaere: Because institutional data will not reside only in repositories and applications owned by the institution, there are more touchpoints that need to be controlled and audited as part of data governance.

Weil: The biggest challenge is getting the right people at the table to take this on. It is not glamorous work and at times can be contentious, but it is vital. As with other data-related issues, the IT organization is not necessarily the right leader for this effort. Depending on the institutional culture, the IT organization may take the role of a co-leader or a strong partner. It

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is also important not to get discouraged by the magnitude of the effort. There are others who have been very successful in implementing effective data governance practices, and commercial tools and organizations can also help.

involves a cost to build and incurs a commitment to long-term support and maintenance.

Rathje: We are moving from monolithic solutions, where the data was well

services, is very much like urban planning. In both cases, ecosystem efficiency and usability are factored into choices so that decisions are not solely based on the narrower interests of individual projects.

“Data from both institutional systems and outside sources are needed for addressing strategic challenges.”

—William Liddick

What are the biggest opportunities for this issue in the future?

Rathje: Trusted, dependable data that has the integrity to positively inform critical academic and business decisions.

Weil: Shared agreement across the organization on the meaning of various data elements. A single source of truth.

DeBaere: Strategies that allow an organization to centralize access to data. For example, the use of an integration platform with prepackaged data flows and built-in administration of data governance can provide wide access while controlling data governance risk.

Issue #8 (tie): Digital Integrations

Ensuring system interoperability, scalability, and extensibility, as well as data integrity, standards, and governance, across multiple applications and platforms

What are the biggest challenges for managing this issue?

DeBaere: A big challenge in data integration is solution sprawl. Because our next generation IT environments will involve an increasing number of components from an increasing variety of vendors and other sources, there is risk of creating dozens of integration services, each of which is customized for a different use case and cannot be repurposed. Each of those specialized integration services

structured and the system performance well understood, to solutions that are decoupled and where management of the resources requires multiple SLAs, contracts, and additional administrative controls. Having standards that define an organization's approach and instituting policy that governs that approach are keys to successful solutions.

What are the biggest opportunities for this issue in the future?

DeBaere: Organizations should review digital integration requests with an eye to maximizing reuse of solutions. Where reuse is not possible, the use of standards and guidelines for integrations can minimize the long-term technical debt.

Rathje: Working in collaboration with peers and finding organizations that can manage the new middleware paradigm are opportunities for the future. Through participation in discussions with these groups, organizations will gain insights about best practices.

What are your thoughts about the connection and synergy between all four of these issues?

DeBaere: To address the challenges in data integrations and data governance, organizations can adopt a disciplined approach to planning the entire IT landscape. This disciplined approach, which can include the definition of standards, guidelines, and common services for IT

Rathje: These issues are symbiotic and work with each other to help organizations leverage data to improve student outcomes. Effective governance can help manage the organization's data interests regardless of where the data lives or who manages the solution.

Weil: As we think about the next generation of enterprise IT, these four issues are all influencing factors and help set the stage for where we need to head. The next generation will require us to adopt a way of thinking that focuses on furthering integrations and on leveraging data to provide a mission-driven/client-centric approach to our work at an institutional level. The fact that these four data-related issues made the EDUCAUSE Top 10 IT Issues list shows that people are thinking about the important role that data will play as we contemplate and develop our future services, systems, and capabilities. ■

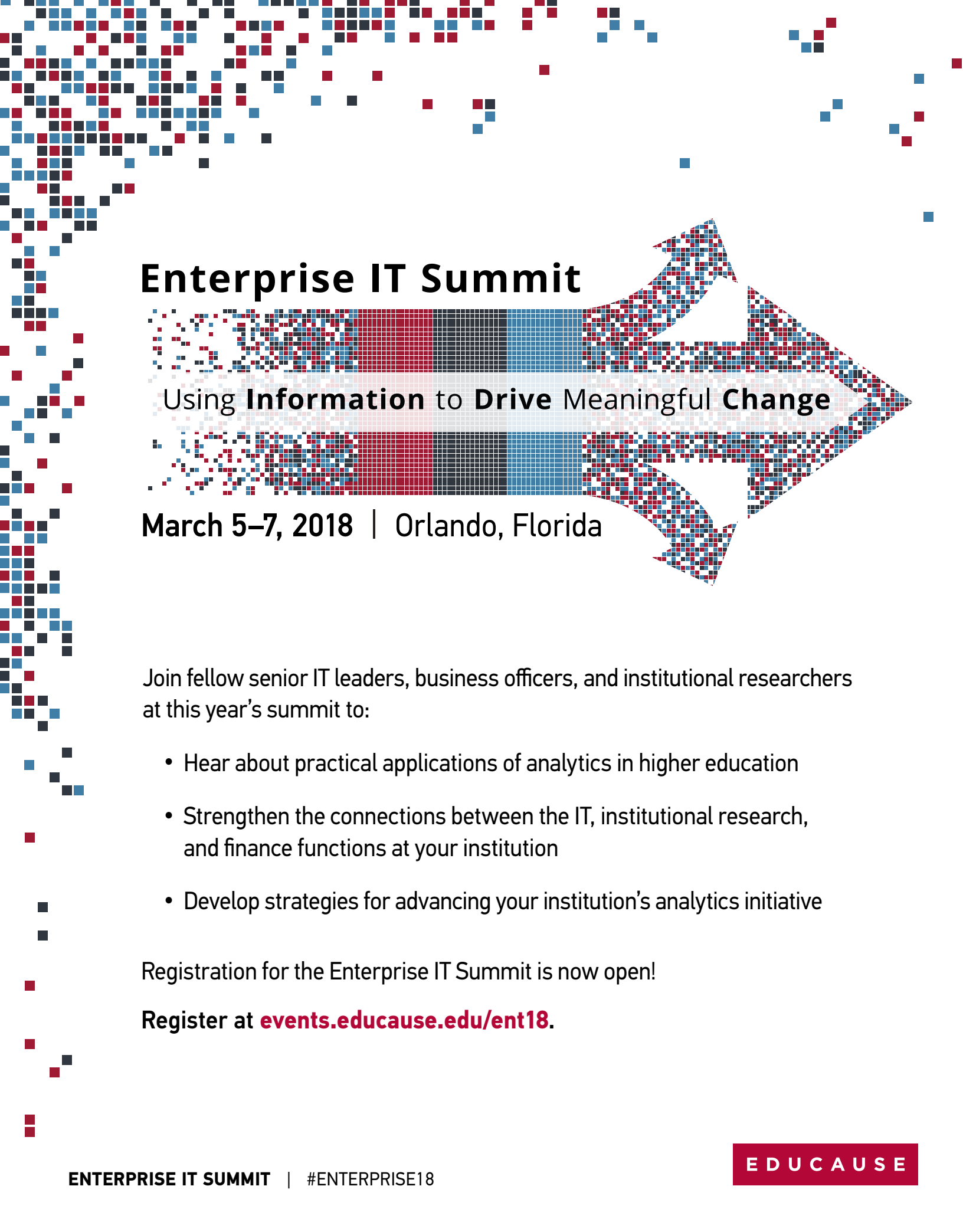
Notes

1. The EDUCAUSE Enterprise IT Program (<http://www.educause.edu/enterprise-it-program>) helps to make campus enterprise IT more informed, efficient, and strategic.
2. David Weil and Josie DeBaere explore this concept further in their article “Enterprise Architecture Practices: A Holistic Approach for Planning Next Generation Services,” *EDUCAUSE Review*, July 17, 2017.
3. For example, see the model presented by Arizona State University.
4. See Michael Kelly, “The Chief Data Officer in Higher Education,” *EDUCAUSE Review*, June 8, 2015.
5. For more details, see “Dr. Yuko Mulugetta named Chief Analytics Officer,” Ithaca College press release, September 29, 2016.

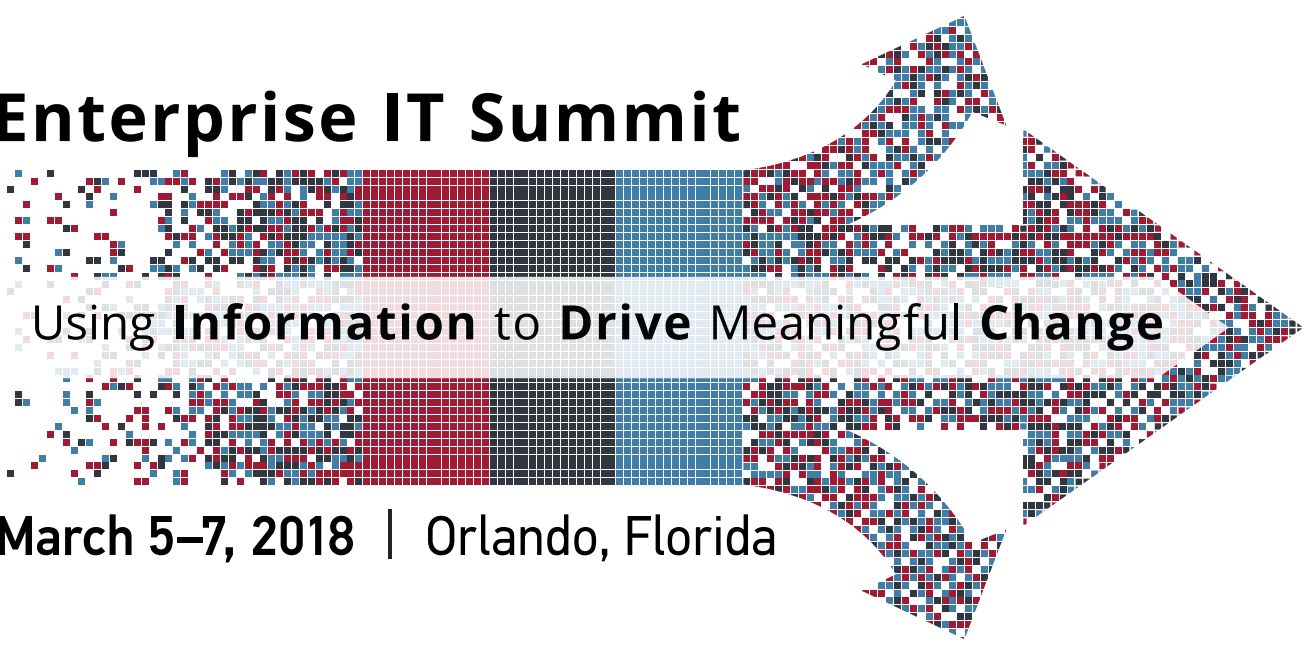
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(continued from page 34)



Issue #5: Student-centered Institution

Understanding and advancing technology's role in defining the student experience on campus (from applicants to alumni)

Vanessa Hammler Kenon,
David Weil, and John Wood

Technology can be used to engage students with the institution at all points in the relationship, from prospect to alumni, and to facilitate moves among institutions.

How technology can define the student experience on campus depends on the institution. Recruitment, retention, student success, and philanthropy are all drivers. Institutional leaders need to think about the student experience with technology and how to best use technology to engage and interact with students. They must look at today's experience and the number of technologies that students currently need to connect with during the course of the educational journey. IT leaders should consider how to make technologies frictionless and should permit easy technology transitions throughout students' life cycle for a more meaningful experience. Many institutions

are trying to integrate disparate systems into a single, seamless platform that gives students, advisors, faculty, and other constituents tools to make the students feel well connected and engaged and, ultimately, that contributes to a student success strategy.

For many institutions, students' experiences with the institution are predominantly not face-to-face. Students expect the campus to come to them. This is also true of most alumni, and so a vibrant online presence is a key part of how an institution can use technology to express itself.

Who Outside the IT Department Should Care Most about This Issue?

- Faculty and academic support and provosts, because they are closest to the students
- The vice president for student success, as the key player in all aspects of student engagement/experiences with the institution (from successful recruitment to completion)
- Institutional leaders, because their jobs and funding are attached to items like completion/retention and affect the reputation of the institution
- Industry, the employers, and the community, as the ultimate clients of the institution. They have a vested interest in securing graduates with the most up-to-date technology, and many of them are investing funds and time into the institution.
- The students themselves. They are the consumers of the educational product we are delivering, and they should have a voice.

- The ancillary services department, because much of its engagement with students is online (e.g., textbooks, event ticket purchases, payment processing)

The Misconceptions

- There is a single, optimal way for a student to engage with the institution via technology. (There may be more than one student engagement experience and institutions need to provide multiple, personalized student experiences.)
- Some aspects of information technology that underlie students' experiences, like the LMS, are a commodity, like facilities or the parking garage, and can be managed accordingly. (Production information technology is different from physical infrastructure. It is not place-bound or time-bound, and it needs to operate like clockwork and feel like a friend.)
- Applying technology to the student experience is fundamentally a technology issue and can primarily be left to the IT department. (The IT department alone cannot design technology's role in defining the student experience. This is an institution-wide issue that requires multiple players from across the academy, including faculty and advisors.)

The Pitfalls

- Sustainability is often an issue: What is the plan to continue to support this work after the initial project funding ends? These projects create tangible experiences for students and others, and concluding that

“Remember why we are here: we are here for the students. IT student success initiatives should be directly tied to the student experiences.”

—Vanessa Hammler Kenon, Assistant Vice Provost, Information Technology,
University of Texas at San Antonio



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they are unsustainable after students start using them can disappoint and alienate students.

- Institutions that jump to a vendor solution without understanding their goals can trip up.
- Institutions that are not willing to revisit their business processes will face difficulty. We must understand how students interact with us today—the good, the bad, and the ugly—and how technology can be used to make that interaction better.

The Opportunity

Institutions that don't become student-centered may not exist twenty years from now. Institutions with a clear vision for technology's role in defining the student experience can improve student satisfaction, which leads to better completion/retention, increased student success and graduation, and greater possibilities for future philanthropy.

Integrating systems into a single student experience platform can also lead to better data and then to better decision-making.

Advice

To get started:

- Find institutions with successful student-centered technology experiences/projects; join relevant communities of practices (e.g., EDUCAUSE constituent and discussion groups); read online articles; attend conferences.
- Build a guiding coalition. It should cut across the institution, so you want to be intentional about this.
- Address the business processes that compose the student experience, and direct the technology discussion toward how to implement improved processes.
- Learn about the challenges that students, the most important stakeholders, have faced in interacting with your institution, and find out what they might really want.

To develop further:

- Don't focus on a solution from one particular vendor. You will most likely need components from a number of vendors, so it is important to understand the vision and foundational architecture for where you are heading.
- This is not a project with a beginning, middle, and end. You are always going to be in the middle of this, and it is never going to end. Students will keep coming and changing, and you are going to have to change with them.
- Engage with multiple stakeholders to gather their perspectives and feedback from activities. Listen to your student feedback, and go back to your vendors with that feedback.

To optimize:

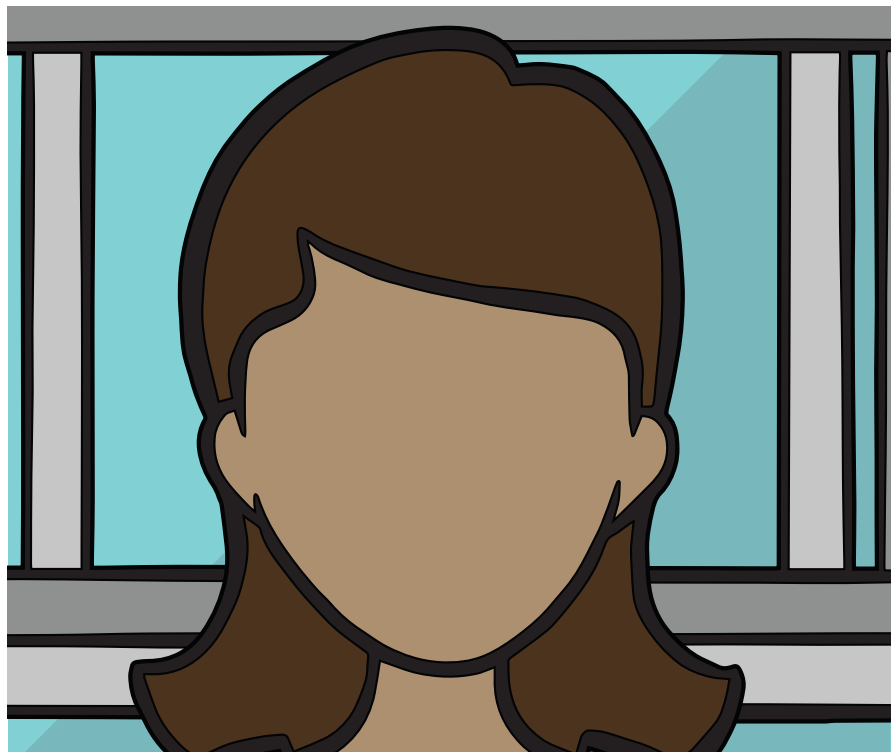
- Provide ongoing training to accommodate ongoing changes in students' needs and the products and tools. Give vendors an opportunity to come on campus to talk/learn from students.
- Governance is important as you move from project to process. All of your major efforts in information technol-

ogy and across the institution need to overlay on a student-centered effort.

Ecosystem Opportunities

Leaders need to reach beyond their institutions to talk together, collaborate together, and advocate together. Concerns about vendor costs, particularly when in areas with little competition, might be addressed productively by approaching vendors collectively.

Coalitions might collaborate particularly on three issues: (1) investigating the integration and interoperability standards needed to help improve the student experience and reduce the friction between components, (2) working across the industry to analyze and reengineer the out-of-the box business processes that new systems provide, and (3) engaging in more deliberate, larger conversations to more clearly and thoughtfully define the role of information technology in the student experience. The EDUCAUSE Next Generation Digital Learning Environment (NGDLE) work and Unizin are two related efforts.





Issue #6: Higher Education Affordability

*Balancing and right-sizing
IT priorities and budget
to support IT-enabled
institutional efficiencies and
innovations in the context of
institutional funding realities*

Raechelle Clemmons and
Justin Sipher

The higher education business model is unsustainable. The annual cost increases to sustain the current model of delivering higher education often outpace the growth in family income. Information technology, as a critical institutional partner, needs to become part of the solution to the cost of higher education. And yet, between external pressures (e.g., compliance requirements, information security challenges, and market IT salaries) and internal desires to apply technology to more initiatives and services, institutional IT costs are increasing.

Institutional leadership needs to understand the importance of digital maintenance. Buildings may last for many decades; technology's lifespan is much shorter and more volatile. Technology has been used in other industries to dramatically shift and reduce cost structures; higher education has not done so, for a variety of reasons. We may have created our own worst-case scenario: We have not

been able to shift from sunk, legacy costs and transition to new technologies, a situation that has been inefficient and has not allowed us to maximize the value of new technologies. How do we let go of things that we have historically done but that are no longer differentiators?

Who Outside the IT Department Should Care Most about This Issue?

- Senior leadership and boards, because this is not a technology issue, this is a business issue

The Misconceptions

- Using technology to gain efficiency will diminish mission effectiveness. (Win-wins—technology-enabled solutions that are both more efficient and effective and more desirable to the populations that the IT organization serves—are attainable. Leaders need to look through the lens not of technology because it's inherently good but, rather, the lens of technology applied in the context of the mission to gain efficiencies and effectiveness and to achieve strategic objectives.)



- IT departments should be able to lower costs by moving to the cloud. (In reality, cloud services are an extension of our existing infrastructure, not a replacement. This growth to outsourced suppliers increases complexity and cost.)
- Technology efficiencies should reduce the IT budget. (Often, the efficiencies accrue to the business units. For the institution to remove costs, it needs to shift cost structures across the institution, which happens less often than it might.)

The Pitfalls

- Focusing on the short-term costs of technology rather than long-term investments: letting technology debt accrue can increase the likelihood of information security incidents, infrastructure challenges, and not being able to meet community needs. The CIO and IT governance structures need to address long-term needs.
- Confusing the “who we are” with the “way we do things” when we are talking about mission-centric activities: technology can positively benefit education, although it has frequently been miscast. Technology is the “how,” but it has been conflated with the “who/what.” We have to understand that the “how” has changed and will continue to change over time; “we” and our values do not necessarily change over time.

The Opportunity

The technology disruption that has affected other industries has not been successful or gone very far in higher education. Institutions that can balance and rightsize IT priorities and budget to support IT-enabled institutional efficiencies and innovations in the context of institutional funding realities will increase their own longevity and will help lead the way for the future of higher education. Institutions that have mastered how they are spending and investing their money will be positioned well as changes come around the corner. They will be able to react quickly.

“People can see an institution’s physical deferred maintenance and understand the importance. Most people can’t see the digital infrastructure deferred maintenance challenge that is equal. If we don’t successfully address the institutional digital infrastructure, it can have a significant impact on our educational mission as well as have reputational damage.”

—Justin Sipher, Vice President, Libraries and Information Technology,
St. Lawrence University

Advice

To get started:

- Understand your cost structures, which means understanding the service that you are providing. Standardize, define, and document the IT service management portfolio to understand the costs of information technology to the organization. This will help you determine and communicate whether a service is high/low value when compared with its costs.
- Determine your opportunity costs (e.g., what else you could be doing). Engage at the institutional level to look at the institutional financial models and at the impact that technology levers can have on those. Ask yourself: If we do this, what can that change at the institutional level, not just at the IT department budget level?
- Frame your services in the context of what is most mission centric.
- Communicate frequently with stakeholders so that they understand institutional IT service provisioning.

To develop further:

- Be able to articulate the value of information technology outside of the context of cost. Help to frame IT services to show that they are mission aligned and have value. You lose

people when you are just presenting a cost argument.

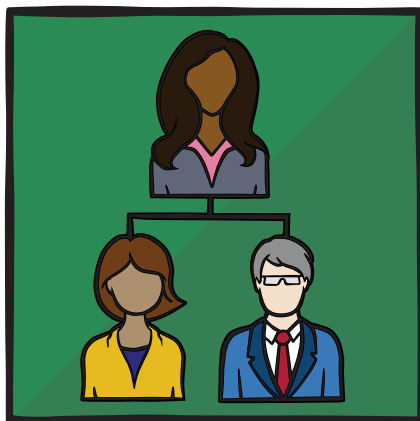
- Define information technology as an investment in the future. Then plan for all IT work using a business case methodology that requires return-on-investment calculations and measurable benefits realization.
- Don’t get complacent or stuck in the mindset that things must be done a certain way.

To optimize:

- Share your insights with the field, to help advance all of higher education.
- Go bigger. Find ways to leverage capabilities and services across institutions in order to create efficiencies.

Ecosystem Opportunities

Consortia-based or other cross-institutional collaborations might focus on two achievements. The first is creating shared services models to change the funding paradigm. The second is banding together and pushing back on unrealistic and unsustainable cost increases. Vendor pricing is, in many cases, rising too high and too fast (CIOs on the IT Issues panel report that annual 10 to 15 percent increases are not at all uncommon) and is dissonant with higher education’s economic realities.



Issue #7: IT Staffing and Organizational Models

Ensuring adequate staffing capacity and staff retention in the face of retirements, new sourcing models, growing external competition, rising salaries, and the demands of

technology initiatives on both IT and non-IT staff

Sharon E. Blanton,
Daniel R. Drenkow,
Kathy Lang, and John Wood

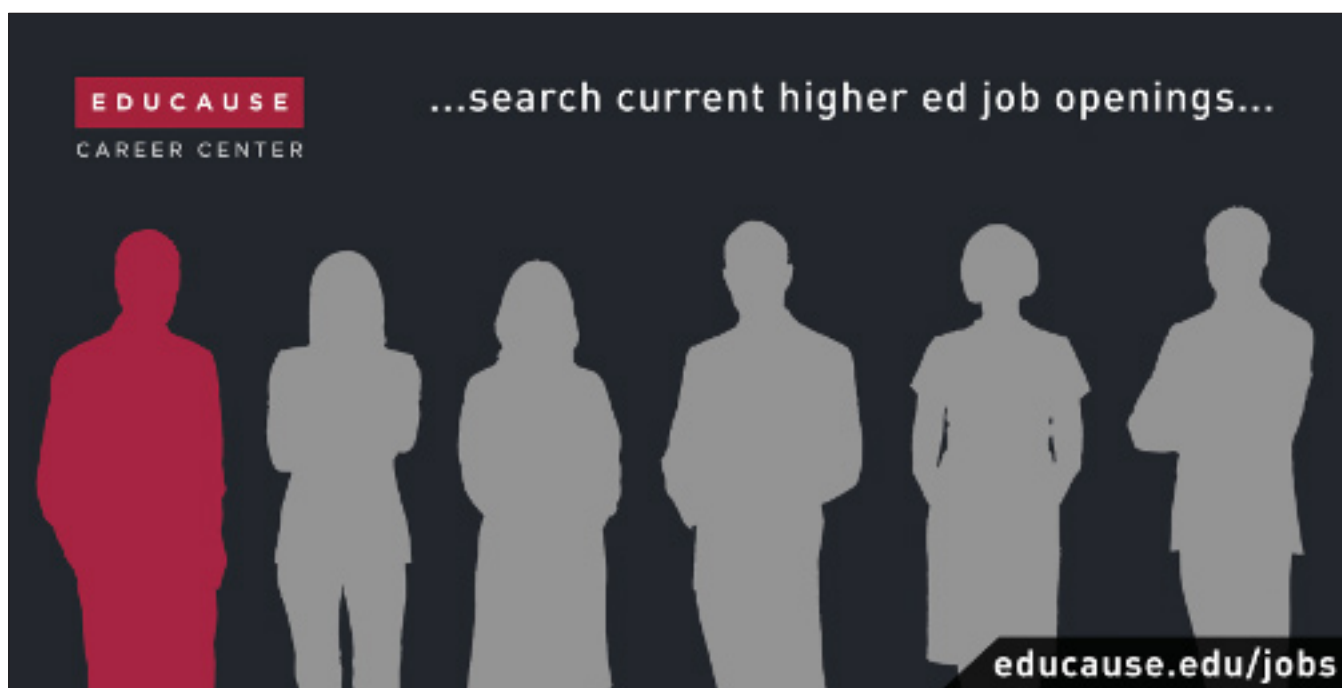
The nature of work in information technology has changed dramatically within just a few years. As technology solutions and their management evolve, the IT organization and the people who work there must evolve. Higher education institutions and their IT organizations need fewer programmers and developers and more vendor and service managers, business analysts, architects, integrators, and data scientists.

The challenge is not limited to changing job roles. The people are changing too. With less direct connection to academic life and with workloads as demanding as those in other sectors but without commensurate compensation, loyalty to a particular institution or to higher education itself has eroded. Almost half the IT workforce is now at high risk of leaving the institution.¹⁴ New hires don't stay as long as

they used to. The U.S. workforce in general is becoming more transient.

All this churn demands agility in recruitment, hiring, and onboarding, as well as flexibility in work arrangements. HR staff need new skills and resources to help IT managers, and IT managers need superlative management skills. Because even though staff consider salary when they accept an offer, they rarely *leave* primarily for better pay; they leave for better opportunities and a more supportive workplace.¹⁵ Business units also feel the impact of new technology-laden initiatives. An institution running several major simultaneous initiatives needs to consider whether it has the capacity in both the business unit and the IT organization to successfully implement all projects concurrently.

One thing is certain: IT roles will continue to change. AI, machine learning, and blockchain are just a few examples of dramatically new technologies that will surely engender dramatically new roles for the IT organization and the people who work there. Institutions that don't figure out how to support their technology workforce needs will be at a chronic disadvantage.



Who Outside the IT Department Should Care Most about This Issue?

- Presidents and boards, because the day-to-day business and strategic direction of the institution rely on information technology. It is “mission critical.”
- HR leaders, because their organizations have shared responsibility for the health of the IT workforce
- Students, because they are skilled critics of technology and have an increasing voice in what the IT department is delivering

The Misconceptions

- Cloud computing and consumerization have simplified IT jobs. (In reality, new technologies have increased the technical complexity. The roles have changed and so have the skill sets, but the level of complexity is ever-increasing. The IT organization is complex in another way too: it is the most cross-siloed activity at the institution because it touches everything.)
- IT staff are easy to manage and easy

to replace. (Finding replacements with similar skills can be difficult or impossible. IT staff have numerous skills, abundant curiosity and ambition, large and complex workloads, and plenty of other opportunities. The slow pace of technology adoption in higher education operations areas, in comparison with other industries, or being given too many routine assignments can cause staff to seek other jobs.)

- The potential IT workforce is enormous, because information technology is a cool and appealing profession. (Though a job in information technology may appear “cool,” the work can be hard, demanding, and often dull. The STEM and other skills needed to successfully train and succeed in these roles are rare in today’s emerging American workers.)

The Pitfalls

- Institutions are financially strapped, but underspending on IT staffing can be, ultimately, more expensive. For some jobs and in some local markets,

institutions must consider paying market salaries—or at least closer-to-market salaries—to attract and retain talent. This can have a cascading effect throughout the IT organization.

- Management is not an occasional activity, limited mostly to hiring new staff and conducting performance reviews. IT managers need to continue to show how they value staff and must help to make each position “the best job” of a staff member’s career. They must provide genuine feedback to help staff develop, give stretch assignments to encourage new challenges, offer ongoing career coaching, propose service opportunities, and show a sincere commitment to work-life balance.

The Opportunity

Institutions with excellent IT workforce management and development are much better able to adapt to workforce changes and institutional needs. Good IT staffing will be reflected in IT services and institutional initiatives. The institution will have confidence in its ability to use information technology to achieve its strategic objectives. And an effectively managed IT organization can serve as a model for change adoption for other areas on campus and for IT organizations at other institutions.

Advice

To get started:

- Try to quantify the issue. Benchmark against and talk with peers. Use the EDUCAUSE maturity indexes to try to get some objective measures. Explain what is not being accomplished and why.
- Aim for a balance between cross-training and getting the work done, between maintenance and more exciting assignments.
- Ensure your staffing and training plan matches your technology roadmap.
- Introduce incentives to retain staff (e.g., allowing telecommuting) if it is difficult to hire or retain good talent.



“I think we do a lot of good things in silence. I’d like to see IT leaders talking more about their methods, sharing what is working for them and making sure that their colleagues understand the work efforts that go into IT staff retention and employee satisfaction.”

—Sharon E. Blanton, Vice President and CIO,
The College of New Jersey

To develop further:

- Start a mentoring program, which might help with attracting new staff and developing and retaining existing talent.
- Workforce capacity isn’t only about growth. Identify work and services the IT department can stop in order to create capacity for new activities that support the institutional mission.
- Develop and implement a strategy to improve your organization’s diversity, equity, and inclusion. Diversify your IT workforce. Diversity extends to different ethnic backgrounds,

color, gender, age, and education backgrounds.

To optimize:

- Introduce succession planning to identify and develop the next set of leaders and professionals.
- Don’t assume that what got you here will keep you here. Think about coming changes in technology, higher education, and the workforce. Look outside higher education to learn about best practices in IT workforce management in other industries.
- Emphasize promoting from within

the institution by internally developing talent. This creates a sense of optimism in the IT ranks.

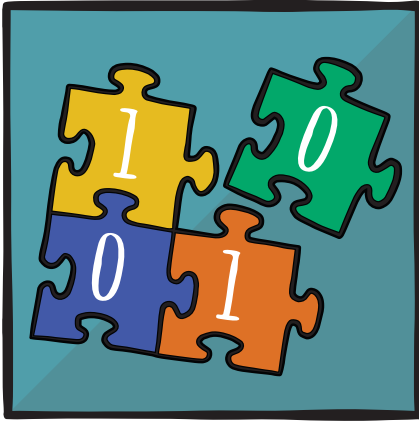
- Develop career paths from local IT into enterprise IT to better leverage and grow skills throughout the institution.

Ecosystem Opportunities

Institutions need to consider new funding sources to help pay for growing IT organizations and increasing salaries. One possibility might include enticing local industries to provide funding support for new IT initiatives. A strong local college or university benefits local businesses by providing a source of new professionals and ongoing development of the local workforce.

EDUCAUSE Management and Leadership Institute Programs enable IT professionals and leaders to learn about information technology, management and leadership, and higher education. Other association-level activities could include developing organizational toolkits for succession planning and other important workforce development practices and coordinating mentoring across the sector.





Issue #8 (tie): Data Management and Governance

Implementing effective institutional data governance practices

Sharon E. Blanton, David Weil,
and Mark Roman

Making good decisions, understanding the keys to student success, or improving yield, retention, and philanthropy—all depend on good data. Colleges and universities have a responsibility to protect the data entrusted to them. Whether to safeguard it or to put it to use, data is an asset, and institutions must govern, protect, and manage it as such. This starts with the basics. Who has the authority to access and use data, which data needs special restrictions, and what is the life-cycle of data?

Data governance is also about a single version of the truth, and decision-makers need to have confidence in the integrity and accuracy of the data used to inform institutional decisions. Without that unified voice of data reason, the institution's data becomes corrupted through uncontrolled replication. This data sprawl

creates information chaos, leading to faulty and expensive decision-making errors throughout the institution.

Who Outside the IT Department Should Care Most about This Issue?

- Senior leaders, because better performance metrics come from better data, and better data comes from appropriate data management and governance
- IR leaders, because effective data management and governance expedites and improves their work
- Business unit leaders, because they care about how institutional and departmental data works for their particular areas

The Misconceptions

- This is an IT issue. (Data governance must be addressed across the institution. Someone must take the lead/accountability for it. The leadership will likely be different at each institution, determined by institutional structure and culture.)
- Combining data from multiple sources is not a big deal. (A great deal of planning and process is needed to bring together data from multiple sources and to ensure that the data is correct. This may be the most systemic, hidden, and non-trivial IT issue facing an institution.)
- Local needs trump larger needs. (Individual business units have very important, focused priorities, but

they remain part of the larger institution. The institution can thrive only if its departments, schools, and other units are able to adopt a coordinated approach to challenges, including data management and governance. Data management and governance really is a team sport.)

The Pitfalls

- Without strong leadership and good process, it is easy to get bogged down, stop too soon, or let a dominant force at the table prevent stakeholders from working through the issues.
- Stating the business value of this very abstract, hard, and complicated work can be difficult. Trying to justify the complexity and the required level of effort is a significant pitfall. The solution is to reframe the issue, from the work that needs to get done to the business value that the successful outcome will generate.
- A lack of trust in institutional colleagues to use the data in a responsible manner, or to protect the data in a responsible manner, can undermine the entire project. Classification and governance establish the rules and policies around using data. This requires some baseline level of trust that stakeholders will do the right thing once the “right thing” is determined.

The Opportunity

Institutions with excellent data management and governance can extract the

“It’s important to realize that you are also changing culture. This isn’t just about filling out forms or defining terms. There is a significant cultural aspect about who owns which data elements and looking at data as an institution-wide asset.”

**—David Weil, Associate Vice President and Chief Information Officer,
Information Technology, Ithaca College**



#StudentSuccess

**Learning is not attained
by chance, it must be
sought for with ardor
and diligence.**

–Abigail Adams

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maximum value from their data. They know where their most confidential data is and can secure it more reliably. Having clean data starts with an architecture that addresses data entity models for the enterprise. Streamlining data practices can also improve the data entry experience for students and faculty. These institutions have also laid the groundwork for analytics and, potentially, AI. Those capabilities can improve learning, students' experiences and outcomes, resource use, and research funding and productivity.

Advice

To get started:

- Avoid getting overwhelmed. Start small. Pick an area that is very small, very important, or very vulnerable, and then build out from there.
- Get input and support from all the right players across the institution before you actually start the project. You need to understand their areas, data needs, and problems and what they expect from better data. Form partnerships.
- Learn from the mistakes and successes of institutions that are more mature than yours.
- Realize that you don't need to do this alone. Various partners and service providers can help institutions get started with this work, and they can be instrumental in defining what needs to be done, talking you through the

issues, and walking you through the initial work.

- Plan from the start for sustainability. Build data management processes and policies that are systemically integrated into the standard operations of the institution, because otherwise data management discipline is easy to ignore by data users who are distributed across the organization and are not focused on common data quality.

To develop further:

- Communicate, communicate, communicate. A lot of the work happens in a small group, but the outcomes touch—and should benefit—the whole institution.
- It is very easy to lose focus on these kinds of projects because they do not have direct impact or immediate results. Be careful to not reallocate resources in the middle of a project.
- To keep the group going, have a credible champion who is dedicated to this work and who is excited about the project.

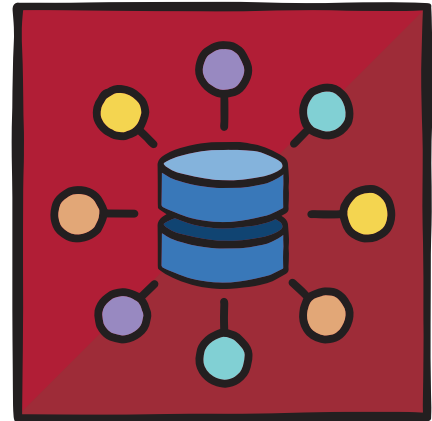
To optimize:

- Data governance and management is an ongoing commitment, a marathon with no end. Do not approach this work as a project with start and end dates. This is a new way of doing business.

Ecosystem Opportunities

Having a standard data model for higher education would be valuable. Vendors have their own data models, and these models are all different. A standard data model would extract time and expense from these efforts and ultimately facilitate student moves across institutions.

Sharing stories and case studies across the ecosystem would also be useful, so that we can learn from one another. The topic needs to be brought to the attention of provosts, CBOs, student affairs leaders, and even presidents. Data governance and management is prevalent within IT conferences and conversations. It needs to move beyond the IT portion of our ecosystem.



Issue #8 (tie): Digital Integrations

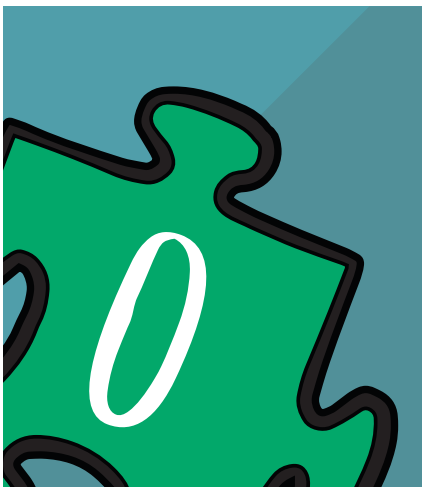
Ensuring system interoperability, scalability, and extensibility, as well as data integrity, standards, and governance, across multiple applications and platforms

Steve diFilipo, Justin Sipher, Angela Svoboda, and Bill Penney

The age of the ERP (enterprise resource planning) system is ending. Institutions are moving to enterprise architectures based on multiple products. Without careful planning, this can easily result in isolated systems, redundancy, and inefficiencies. Building out interoperability reduces inefficiencies and the silo effect, and it allows the institution to operate from a single platform. Without careful integration of enterprise and academic systems (in cloud and on the premises), data integrity is compromised and so are the decisions made based on that data.

Who Outside the IT Department Should Care Most about This Issue?

- IR leaders, because they need data continuity across the institution



- Business area leaders, who rely on good data to inform decisions
- Presidents and CBOs, because funding is increasingly tied to data reporting

The Misconceptions

- Software is like Lego blocks—the systems and the data are easy to connect. (In reality, integrating systems and integrating data across systems are manual and challenging tasks.)
- Data generated locally can be managed locally. (In our interconnected and interdependent data world, decisions at the local level can affect the entire institution. Stakeholders need to understand both the departmental objective and the institutional impact.)
- Data is a byproduct of systems, rather than an asset. (Institution leaders need to understand that data is a critical resource requiring data governance, and they need to understand what it means to govern data across the institution with data stewards, standards, and policies.)

The Pitfalls

- Digital integrations require technical work but are primarily about the institution's data strategy. The work must be an institutional project that begins with data governance and management.
- Not having a good data dictionary can trip up these initiatives. Stakeholders must agree on terms and who owns which data elements; otherwise there are blame issues and data integrity issues.
- In many cases, digital integrations and new ways of managing and using data will change people's jobs. They will need new skills, and not all people will easily adopt the new skills. Those who don't can damage data integrity.

The Opportunity

Institutions that do this very well will have data without doubt and constituents who are all speaking the same data language. They will have improved access to data, enabling better answers

“Data is the context engine of AI. Having a single source of truth with regard to data is critical.”

**—Steve diFilipo, Chief Information Officer,
Institute for Transformational Learning,
University of Texas System**

and decision-making. They will be in a stronger position for process, technology, and system changes in the future.

Advice

To get started:

- You are lucky if you are just starting out, since those who are further ahead have simplified your learning curve. Find them, and learn from them.
- Appoint data stewards, and make sure that they understand their roles in relation to the data governance structure.
- Ensure leadership really understands the importance of data integration; this is an issue that will fail without an institutional commitment.
- Establish policies around software/technology purchases to outline the specifications for ensuring that new solutions are scalable and extensible.

To develop further:

- Striving for perfection may not always be worth the engineering expense/complication. Does your solution meet your needs? Then it might be sufficient.
- Consider establishing a CDO (Chief Data Officer) role or capacity. A CDO,

who does not need to be in the IT department, can help coordinate stakeholders in the functional areas.

- Build enterprise architecture skills in the IT organization so that best-of-breed software purchases can be used to the fullest extent.
- Identify the technical person who can be a liaison in business units to help integrate distributed data.

To optimize:

- Listen to some of the functional and technical staff who are closest to the data and to ongoing activities. These staff know where there are inefficiencies or opportunities and can help you solve or elevate them.
- Move beyond the concept of point-to-point integration and develop an integration platform and/or data lake. This will allow for optimization.
- Share with the rest of the EDUCAUSE community to help others learn and make faster progress.

Ecosystem Opportunities

A dialogue between institution leaders and vendors could increase alignment between the solutions that are provided and higher education needs. Good advisory groups or user communities might help advise vendors.

Standardizing data models across higher education or even including K-12 (K-20) might help influence the development of solutions with more open integration standards, instead of proprietary ones. The challenge will be to align on data definitions. Some efforts are already under way, for example within the Florida system,¹⁶ at IMS Global, and within Unizin. API models can also help.



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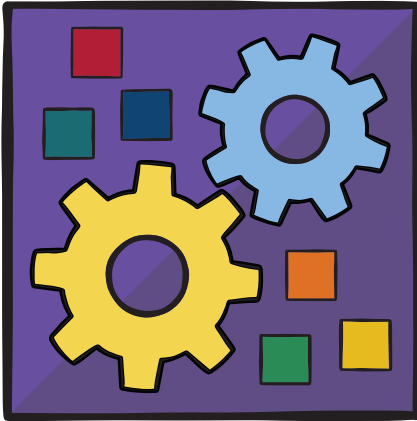
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Issue #10: Change Leadership

Helping institutional constituents (including the IT staff) adapt to the increasing pace of technology change

Raechelle Clemmons,
Chris A. McCoy, Katie Rose,
and Richard Sluder

The world is facing increasing change; disruption and transformation are everywhere. Technology is at the heart of this transition. Technology can be helpful only if people are capable of using it. Ensuring people are ready for the changes that will affect their daily lives is as important as implementing the technology itself.

These are not your parents' changes, limited to learning new software or a new device. Technology has significantly disrupted almost every other major industry, and it is only a matter of time before it disrupts higher education.

People think that change is an event, and that we reach the other side and are done. But change is ever present and is something to work on day in and out. Although we live in a very swiftly moving and change-oriented world, higher education is complex and sometimes slow to respond. How do we move in

a rapid change environment, and how do we become adaptive? All levels of leadership on campus need to be involved. We need "multi-level engaged leadership."

The institutions that handle change the best are those where change seems to occur seamlessly and effortlessly—an ordinary and inevitable part of operations. Here, leaders seem to take the high road. There may be negative conversations, but the starting point for almost all interactions is two steps beyond where conversations seem to get stuck at drama-laden institutions. Leaders at institutions where change seems to occur best have an uncanny sense of timing, an innate understanding of campus climate, a finely tuned sense of priorities, and an ability to draw the best from a variety of personality types. Leaders at these institutions orchestrate change intuitively.

Who Outside the IT Department Should Care Most about This Issue?

- Presidents, boards and academic leaders, because the higher education business model no longer works. Expenses outpace revenue, most expenses are people-related, and higher education is people-intensive. It is only a matter of time before significant change affects us because our model is unsustainable. We need to know how technology is going to affect that.
- Faculty, because technologies such as AI and robotics have teaching and learning applications. Teaching and

learning are changing, and faculty need to learn how to swim with, rather than against, the current of technology.

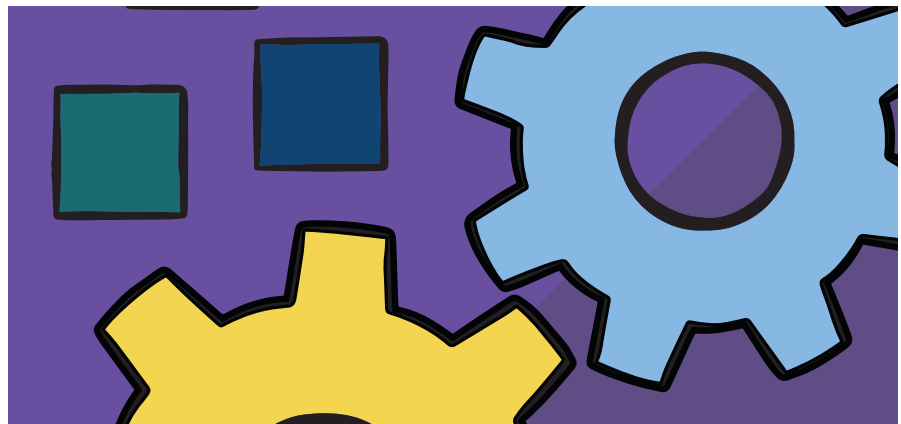
- State legislatures and other policy-makers, because they need to take an interest in preserving the academy

The Misconceptions

- Change is unpleasant. (Institutions need a glass-half-full mindset to achieve change. Leaders need to continually emphasize the favorable parts of change, talk about change in a positive way, and remind constituents of the "why" of change.)
- Change happens organically; focus on the project deliverables, and the change will take care of itself. (In reality, the change itself requires dedicated, special attention.)
- Technology is endemic and cool, and that's why it should be adopted. (Technology has enabling capabilities, and it is important to focus on the *enablement* apart from the technology.)
- Change must be "driven" by a powerful leader who "gets" change more than others. (Organizations will benefit from a leader who prioritizes change, but that leader must build a sense of buy-in and consensus around a change agenda.)

The Pitfalls

- The communication side of change is critically important, and institutions don't always do that well. They sometimes forget to articulate the "why" in ways that are compelling.





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“The only thing constant is change. The pace of change is increasing and we have to ready the institution and our staff for that.”

**—Raechelle Clemmons, Chief Information Officer,
Davidson College**

- Initiative fatigue can stymie effective change. Choose the primary initiatives carefully, limit them to major ones that most benefit the institution, and keep even those narrow. Remain aware of your institution's current change capacity.
- Institutions can make change too mechanical and forget that it is relational. Change is about cultural change first and foremost. Only then can initiatives focus on process or technology.

The Opportunity

Institutions that excel can create the next adaptive model for higher education. Those colleges and universities will be able to demonstrate high persistence through the next centuries.

When an institution excels at change leadership, it is capable of leapfrogging forward, better meeting constituents' needs while delivering an exceptional level of service. Everyone is then able to more easily work toward the mission of the institution. Good change leadership moves organizations through change at the right pace and minimizes disruption and adverse effects on the organization. Doing this correctly presents huge opportunities, including better educational methods, research, and processes and more effectiveness overall.

Advice

To get started:

- Create momentum by focusing on the “why” of change, building a guiding coalition, and communicating relentlessly and positively.
- Engage your constituents—as many as you can and for as long as you can.

- Invest time in learning about change. This is a well-studied discipline.
- Develop institutional structures—processes, programs, roles, and skills—to support the ongoing changes at your institution.

To develop further:

- Learn from the leaders, who can help you apply generic change leadership techniques to your institution or initiative.
- Understand and improve constituents' digital dexterity as a strategy for making change easier. The more dexterous they are, the easier technology change becomes. A focus on digital dexterity (as an institutional or IT goal) can be another way to accelerate change—or at least our ability to change.
- You can accelerate your learning curve through your affiliations. Connect with people who are easy to work with, have made a difference, and are available to assist you.

To optimize:

- Use your momentum to tackle additional changes. It will be much easier, thanks to the groundwork you've laid.
- Partner with other leaders, and share with the community overall.

Ecosystem Opportunities

We should be sharing successful frameworks, tools, techniques, and advice at the ecosystem level. Change happens at the person-to-person level. Really understanding the different tools that have worked elsewhere can help you decide what will work best with the person in front of you. We might develop

consortia and other groups to help manage certain changes.

Although external experts are crucial in supporting the change initiatives higher education is undertaking, we must hold them accountable for focusing on the sustainability of the ecosystem. That will require balancing profit with support and outcomes that allow institutions to progress and endure.

Like politics, all change is local. But the ecosystem can help institutions understand the urgency for broad change and can influence the frame of mind of institutional leaders and constituents.

Reflections and Conclusion

The EDUCAUSE community selected the Top 10 IT Issues from a slate of 18 issues identified by the IT Issues Panel. The following are the 8 issues that did not make the top 10 list, in descending order of importance:

- *Digital Learning:* Developing and delivering online and hybrid learning strategies that fit within the context of the institutional culture and each student's particular educational plan
- *Funding Models:* Adapting IT funding models to accommodate changing IT sourcing strategies (cloud, shared services, etc.)
- *Institutional Compliance:* Responding to an increasingly complex and costly IT compliance environment (e.g., ADA)
- *Digital Future:* Embracing and preparing for the expanding implications of technology for higher education and its impact on the institution
- *Identity Management:* Modernizing institutional identity and access management systems
- *Diversity, Equity, and Inclusion:* Developing an IT organization that reflects and supports institutional commitments to a staff of diverse individuals who feel welcome and valued

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- *Institution-wide IT Governance:* Coordinating relationships, accountabilities, and priorities among central IT and distributed IT staff and organizations
- *Digital Enterprise Transformation:* Developing the business processes and enterprise architecture to move from traditional ERPs to new enterprise IT systems

Even though these 8 issues did not make the overall Top 10, they are not unimportant. Most of them made the Top 10 list of a subset of institutions.¹⁷ In addition, more than 25 percent of institutions rated each of these issues as 9 or 10 on the 10-point scale (1=not at all important; 10=extremely important) used to generate the Top 10 list.

A Matter of Trust

Information security challenges are the shadow cast by data. As data becomes more abundant and more consequential,

that shadow gets longer and darker. It is no surprise that *Information Security* has stayed a stubborn #1 on the Top 10 IT Issues list for three years now. This issue cannot be ignored and seemingly cannot be tamed as higher education's appetite for data grows. The different types of data collected in higher education—whether to fuel student learning analytics, provide services to students, faculty, and staff, conduct research, or run the business of the higher education institution—bring a host of legal, regulatory, and policy considerations to bear. An institution's information security posture, which seeks to protect the confidentiality, integrity, and availability of this data, must scale in this data-rich environment.

Protecting data is a matter of trust; and institutional data integrity is at the heart of this trust. Data integrity is the ability to ensure that data is accurate and consistent. Most data integrity issues to date have been unintentional. But in an era when

truth and reality are viewed as malleable and when data is being weaponized, data integrity is an issue that demands new attention and vigilance. The problem will only worsen. Gartner predicts: "By 2020, AI-driven creation of 'counterfeit reality,' or fake content, will outpace AI's ability to detect it, fomenting digital distrust."¹⁸

And let us not forget privacy, another component of trust. FERPA was enacted in part to ensure students' privacy, HIPAA in part to ensure patients' privacy. Information security breaches are trust breaches. As predictive analytics and other algorithms are used more for decisions about students (e.g., predictive learning analytics), data becomes increasingly consequential and a more attractive target of deeply personal information. Panelists' most urgent advice for *Information Security* was "don't get complacent." A monster really is in the closet.

Taming the monster is especially important for higher education if we are

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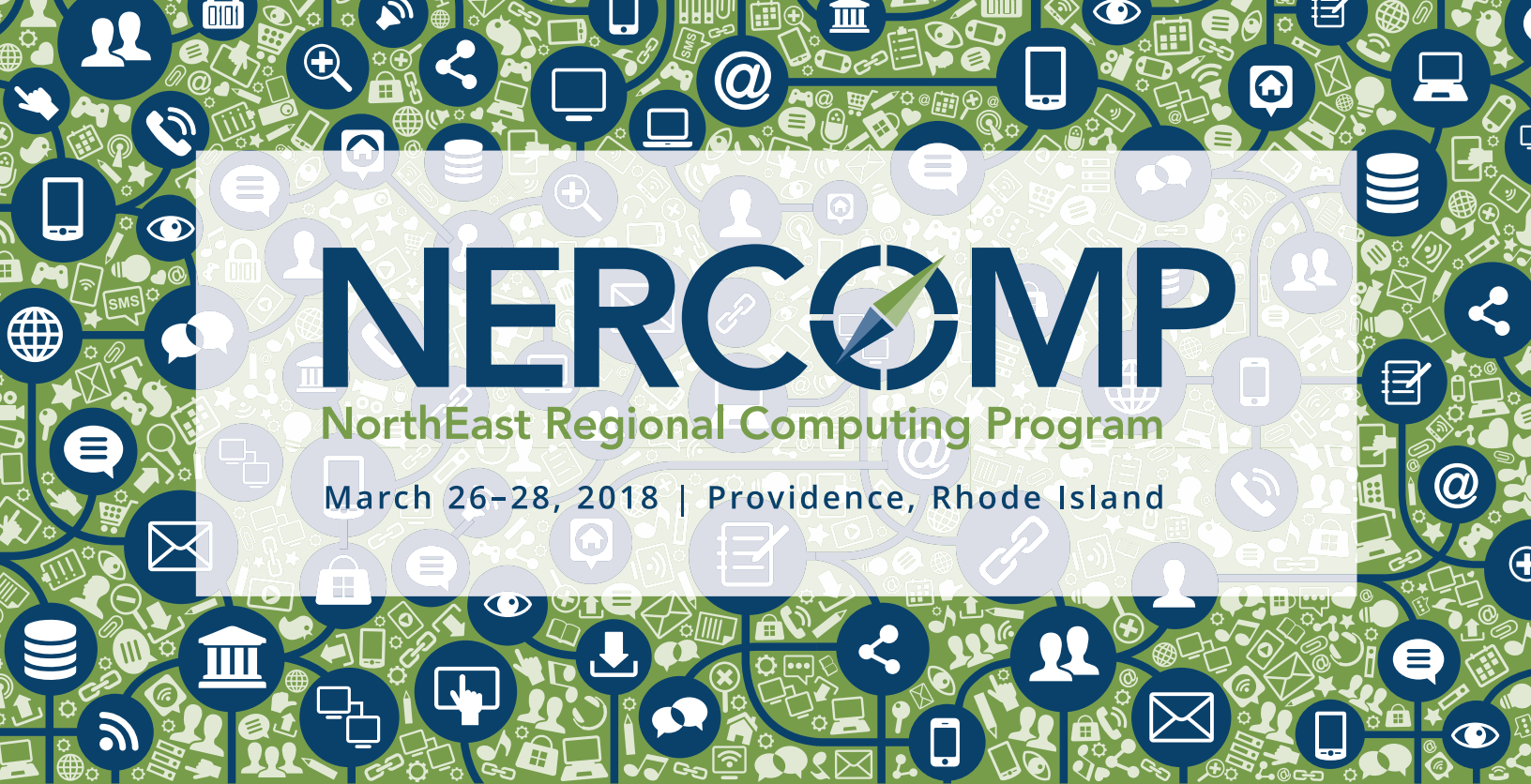
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to retain our reputation for objectivity and accuracy—a reputation that is under threat. Data integrity is a matter of trust, and trust is precisely what higher education is struggling to maintain.

Changes from Last Year

Half of this year's Top 10 IT Issues were new or at least significantly altered from last year. Three issues—*Student-centered Institution* (#5), *Digital Integrations* (#8, tie), and *Change Leadership* (#10)—were entirely new. Two others—*Student Success* (#2) and *Data-enabled Institutional Culture* (#4)—represent major shifts in focus. Converting the raw potential of data into a knowledge and decision-making asset is the predominant technology focus this year. It introduces new work, new relationships, and new challenges throughout the IT organization

and the institution. The work is both tactical and strategic, with system integrations and data management as well as strategic planning and relationship management. Today's data focus is primarily on students. Yet the groundwork laid is increasing the institution's capacity to use data effectively for all kinds of decisions and designs. Institutions are also, in varying degrees of consciousness, preparing to apply AI and machine-learning to their aspirations and activities. We all know our world is changing; some are preparing for that change more intentionally than others.

Today Creates Tomorrow

What will the class of 2030 experience? Will such a concept as “the class of” seem quaint or uncommon by 2030? No one can say, and yet the choices that today's

institutional leaders and boards are making are influenced by their thoughts about the class of 2030 and others—and about the future of their institutions. Every leader is a futurist in that respect, because every leader makes plans based on explicit or unconscious predictions of the future. Today's strategic priorities are bets on tomorrow.

Some higher education institutions are placing bets on technology and are moving more quickly than their peers to adopt technology. These early adopters included in their Top 10 lists two issues that did not make the main list: *Digital Learning* and *Digital Future*. Those institutions are on the frontier of remaking higher education.

Leaders at the early adopters are moving more quickly to incorporate a set of emerging technologies and trends¹⁹ that will remake education, research, and operations at their institutions (see table 1). Early adoption of technology is not the purview of only the large institutions or of only the doctorals. Each type of institution has a sizable proportion of early adopters: community colleges (53%), private masters and doctorals (33%), institutions with fewer than 2,000 students (33%), and institutions with 15,000+ students (42%).

Why does this matter? Evidence is mounting that technology is a major differentiator, a key to productivity and success.²⁰ The future of each college and university is no longer certain. Too many are on financial shaky ground. The academy's primacy in postsecondary credentials is at risk. Institutions can no longer assume that 2030 will look pretty much the same as 2018. The choices that institutions make today will prepare them well for the changes at hand—or will leave them at a growing disadvantage. Institutions that are able to effectively develop and execute a digital strategy may be the most advantaged, and this potential head start is available to any institution.

Parting Words

Don't get complacent. Panelists offered this advice throughout their conversations about the issues this year. Don't get complacent, they said, because we are in an era

Table 1. Technologies and Trends at Early Adopter Institutions

Emerging Technologies	Trends
• Adaptive learning • Blockchain • Courseware • Development tools to support multiple key platforms • Digital microcredentials (including badging) • Enterprise GRC systems • Flexible interactive platforms for descriptive and predictive analytics of institutional data • Games and gamification • High-precision location-sensing technologies • Integration platform as a service • Mobile app development • Mobile apps for enterprise applications • Mobile apps for institutional BI/analytics • Open educational resources • Predictive analytics for student success (institutional level) • Predictive learning analytics (course level) • Remote proctoring services • Support for use of personal cloud services • Uses of the Internet of Things for campus management • Uses of the Internet of Things for research • Uses of the Internet of Things for teaching and learning	• Agile approaches to change • Climate change • Contributions of IT to institutional operational excellence • Data-driven decision-making • DevOps movement • Digitization of scholarly and research data • Evaluation of technology-based instructional innovations • IT as an agent of institutional transformation and innovation • Strategic relationships with vendors • Use of algorithms to influence institutional and individual choices

Sources: EDUCAUSE 2018 Strategic Technologies Glossary; EDUCAUSE 2018 Strategic Trends Glossary

of change, and as one panelist memorably put it: “Change doesn’t have an end.”²¹ Success generates new ambitions; risks are mitigated but rarely overcome.

Share the Top 10 IT Issues list throughout your institution. Discuss it with your peers within, but especially beyond, the IT organization. Panelists consistently expressed frustration with the widespread misconception that the issues on the Top 10 IT Issues list and other technology priorities are for the IT department to solve. Nothing, they felt, could be less true. Technology may be difficult, but it is nonetheless the *easy* part of a student success initiative, an analytics priority, or even an information security strategy. The challenges related to people, processes, and policies dwarf the mechanistic technical work.

And that takes us to the panelists’ final advice and the parting words for all readers of this article: *Everyone needs to care about all of these issues.* None of these issues can be left to the CIO or to the IT department or to the institution’s leadership or to any small group of stakeholders. The 2018 Top 10 IT Issues are about *remaking higher education*. Remaking higher education doesn’t just take a village, or even an institution or system. It requires the full ecosystem of higher education.

Remaking higher education in a digital world calls for constituents throughout the institution, regardless of their role, to better understand the possibilities, limitations, and responsibilities that our technology- and data-rich environment has afforded. It calls for academia’s gloriously independent nature, which has fostered so much creativity and invention, to recognize and embrace the affordances of interdependence and collaboration. It calls for all members of the IT workforce to immerse themselves in their institutions’ activities and missions. It calls for policy-makers to recognize the impact that technology is making on higher education and to consider this impact in the context of the culture, missions, and benefits of higher education. It calls for vendors and solution providers to consider the effect their products and services are having and

may have on higher education, in addition to the effect higher education is having and may have on their profitability. It calls for higher education decision-makers to learn how to operate in the ecosystem beyond their institution; the ivory tower is not impermeable. Remaking higher education in a digital world calls for everyone—students, researchers, instructors, administrators, librarians, technologists, business officers, all constituents—to accept that change is upon us and will not end. We are in an era of great change. We are all called to engage. Answer the call. ■

Notes

1. Once a year, members of the EDUCAUSE IT Issues Panel select a slate of 15–20 topics they believe will be the most important IT-related issues facing higher education institutions. EDUCAUSE members receive a survey with those issues and are asked to prioritize them. The 10 issues with the highest-priority scores become the Top 10 IT Issues. This methodology also enables EDUCAUSE to determine the Top 10 IT Issues among various types of institutions. For 2018, 11,797 email invitations to complete the survey were sent to EDUCAUSE members, and 438 (3.7%) completed the survey. Where multiple representatives from a single institution completed the survey, we selected the response from the representative in the highest-ranking position to determine the Top 10 IT Issues. The final Top 10 IT Issues list is thus based on the responses of 310 U.S.-based respondents.
2. Karen Vignare, “Why Adaptive Courseware Will Scale in Higher Ed,” *Transforming Higher Ed*, *EDUCAUSE Review*, September 18, 2017.
3. “ASU, Amazon Bring First-of-Its-Kind Voice-Technology Program to Campus,” *ASU Now*, August 17, 2017.
4. Kristi DePaul, “Ramapo College: Boosting Retention Rates with Inclusive Student Services,” *Transforming Higher Ed*, *EDUCAUSE Review*, August 31, 2017.
5. Sri Ravipati, “5 VR Trends to Watch in Education,” *Campus Technology*, May 16, 2017.
6. Georgetown University, Digital Storytelling Multimedia Archive and Website, accessed November 21, 2017.
7. Jonathan S. Gagliardi, Lorelle L. Espinosa, Jonathan M. Turk, and Morgan Taylor, *American College President Study 2017* (Washington, DC: American Council on Education, 2017).
8. See *Kotter International, 8 Step Process* (website).
9. EDUCAUSE strategic trends data, 2017 and 2018. For 2017 data, see Ana Borray and Nancy Millichap, *2017 Trends and Technologies: IPASS*, research report (Louisville, CO: ECAR, May 2017). The 2018 data will be published later this year.
10. National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education, *Digest of Education Statistics*, Table 326.10 (2016).

11. See, for example, Donna Desrochers and Rick Staisloff, “Creating Sustainable Innovation with iPASS,” *Transforming Higher Ed*, *EDUCAUSE Review*, March 8, 2017.
12. Michael King, “The AI Revolution on Campus,” *EDUCAUSE Review* 52, no. 5 (September/October 2017).
13. Nick Harrison and Deborah O’Neill, “If Your Company Isn’t Good at Analytics, It’s Not Ready for AI,” *Harvard Business Review*, June 7, 2017.
14. Jeffrey Pomerantz and D. Christopher Brooks, *The Higher Education IT Workforce Landscape*, 2016, research report (Louisville, CO: ECAR, April 2016).
15. Pomerantz and Brooks, *IT Workforce Landscape*, 2016.
16. See *Florida Department of Education, PK-20 Education Data Warehouse*.
17. EDUCAUSE publishes Top 10 lists for fifteen subsets of institutions: seven groups based on Carnegie classifications (Associates, Bachelors, Private Masters, Public Masters, Private Doctorals, Public Doctorals, and non-US), five institutional size groups (fewer than 2,000 students, 2,000–3,999 students, 4,000–7,999 students, 8,000–14,999 students, and 15,000+ students), and three approaches to technology adoption (later than peers, at the pace of peers, and earlier than peers). We also review the Top 10 lists of several IT sub-professions. These lists are available on the *EDUCAUSE Top 10 IT Issues* website.
18. Kasey Panetta, “Gartner Top Strategic Predictions for 2018 and Beyond,” *Smarter with Gartner*, October 3, 2017.
19. Since 2014, EDUCAUSE has examined higher education’s top strategic technology priorities. In our research, *strategic technologies* are the emerging technologies and trends that institutions will be spending the most time implementing, planning for, and tracking in the coming year.
20. Walter Frick, “The Real Reason Superstar Firms Are Pulling Ahead,” *Harvard Business Review*, October 5, 2017.
21. Katie Rose, Senior Director, User Services, University of Notre Dame.

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Susan Grajek (sgrajek@educause.edu) is Vice President, Communities and Research, for EDUCAUSE.

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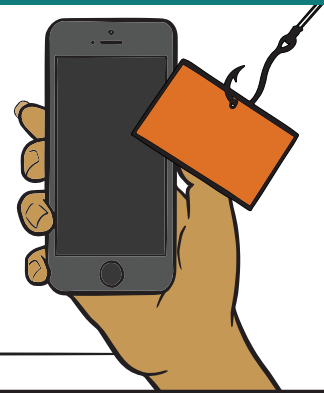
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TOP 10 IT ISSUES 2018

The top IT issue for 2018 is #1 INFORMATION SECURITY

Developing a risk-based security strategy that keeps pace with security threats and challenges

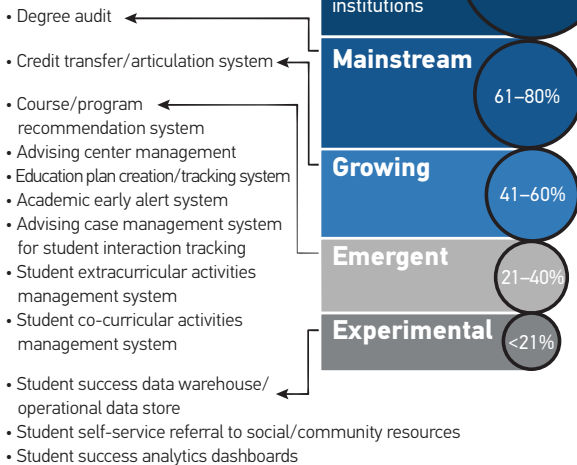
69% of all U.S. institutions that have conducted a risk assessment did so for planning and prioritizing institutional information security work.



#2 STUDENT SUCCESS

Managing the system implementations and integrations that support multiple student success initiatives

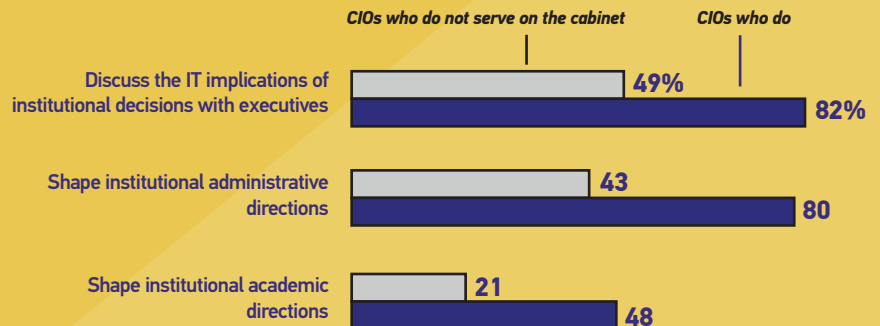
The digital capabilities deployment of student success technologies among U.S. institutions in 2016:



#3 INSTITUTION-WIDE IT STRATEGY

Repositioning or reinforcing the role of IT leadership as an integral strategic partner of institutional leadership in achieving institutional missions

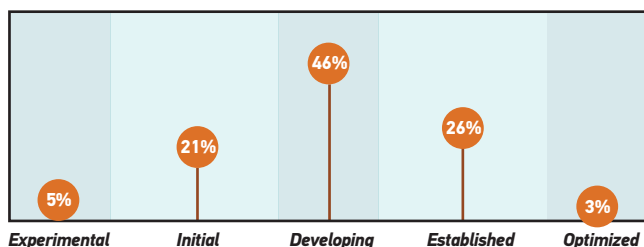
In a survey of CIOs, ECAR found that 42% of respondents serve as members of the president's or chancellor's cabinet. Those who do are positioned to have a significant impact on institutional strategy.



#4 DATA-ENABLED INSTITUTIONAL CULTURE

Using BI and analytics to inform the broad conversation and answer big questions

The EDUCAUSE Maturity Index for analytics shows that most institutions are developing a decision-making culture.



#5 STUDENT-CENTERED INSTITUTION

Understanding and advancing technology's role in defining the student experience on campus (from applicants to alumni)

25% of U.S. institutions have a system to track co-curricular activities



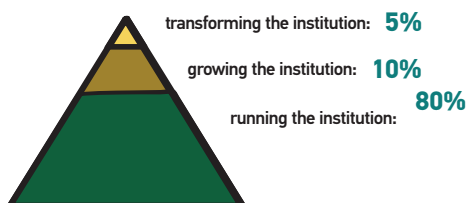
27% of U.S. institutions have a system to track/manage extracurricular activities

The 2018 Top 10 IT Issues show how digital technology is remaking higher education through four key themes: institutional adaptiveness, improved student outcomes, improved decision-making, and IT adaptiveness.

#6 HIGHER EDUCATION AFFORDABILITY

Balancing and rightsizing IT priorities and budget to support IT-enabled institutional efficiencies and innovations in the context of institutional funding realities

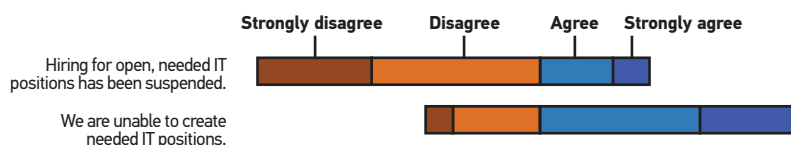
Among U.S. institutions reporting to the EDUCAUSE Core Data Service, the median percentage of total central IT spending on...



#7 IT STAFFING AND ORGANIZATIONAL MODELS

Ensuring adequate staffing capacity and staff retention in the face of retirements, new sourcing models, growing external competition, rising salaries, and the demands of technology initiatives on both IT and non-IT staff

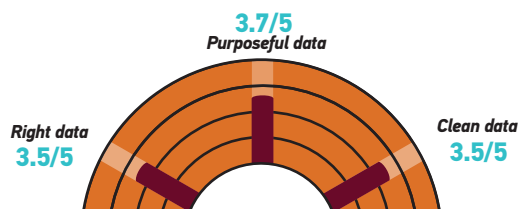
ECAR workforce research found that there is demand for IT professionals in higher education, but there are obstacles to creating new IT positions.



#8 (TIE) DATA MANAGEMENT AND GOVERNANCE

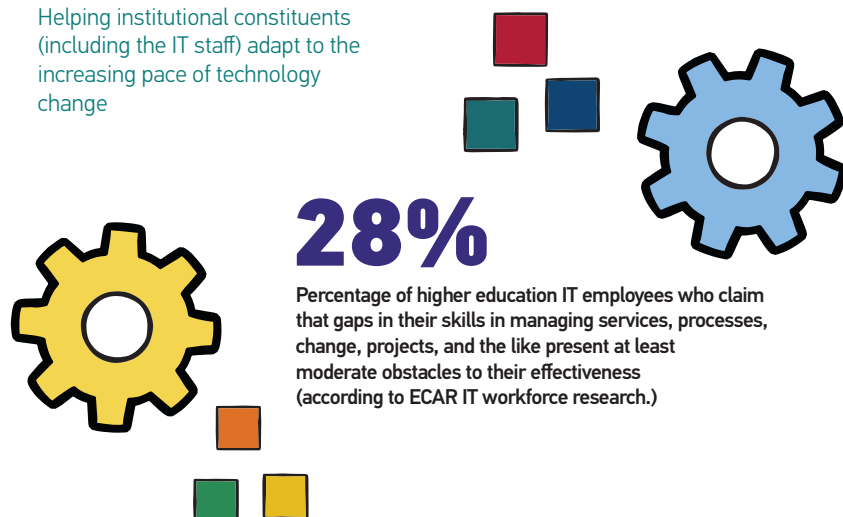
Implementing effective institutional data governance practices

The maturity levels of analytics data efficacy at the median U.S. institution are still developing.



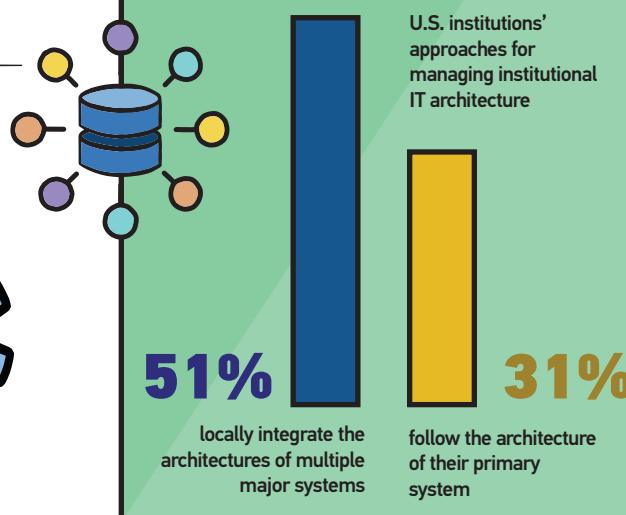
#10 CHANGE LEADERSHIP

Helping institutional constituents (including the IT staff) adapt to the increasing pace of technology change



#8 (TIE) DIGITAL INTEGRATIONS

Ensuring system interoperability, scalability, and extensibility, as well as data integrity, standards, and governance, across multiple applications and platforms



TO LEARN MORE about the Top 10 IT Issues, visit educause.edu/issues. To access the latest publications, including reports and infographics, from the EDUCAUSE Center for Analysis and Research, visit educause.edu/ecar.

Information Technology and Its Future Role in Student Success

The increased role technology plays on today's campuses, especially in areas such as data collection, analytics, and predictive modeling, has taken it far beyond a simple support structure. The ability to not only impact student success models but to take leading roles in future success plans requires campus leaders to rethink their IT structures and determine the best ways to maximize IT potential. The ability for IT to be at the forefront of student success models also raises challenges and questions that need to be answered.

Pelletier sums up the simplistic nature of the future of data on campuses: "With more technology comes more data. With more data comes the need for more technology to make sense of it all. Without experience, insight, and a firm fix on their missions, colleges and universities can get swamped and ultimately paralyzed by the flood of information."¹ Does it not make sense then to include the very people that run technology and data collection on campuses as part of the bigger picture, especially when strategizing about future initiatives and their impact on student success? Imagine the possibilities with technology staff working hand-in-hand with others on the campus to better understand what questions need to be answered with data, and what processes need to change with technology to better serve the campus and the students? Some additional soft skills will be needed for IT staff to perform at this level, and IT structures and job duties and responsibilities will need to change.

As colleges and universities move forward with technology and the utilization of data, it becomes imperative that both the communication of its potential and a stronger understanding of that potential reach all levels of an institution. While "many college and university executives are convinced of data's value, many institutions are still finding their way in learning how to use data effectively and strategically."² The point can be raised that the very professionals in charge of data and technology can also be leaders in educating those on campuses of the many uses of data systems and data collection. However, those same technology professionals would be more valuable if they were part of the equation from the start, offering them a better understanding of the institution's vision, mission, and goals

and, therefore, allowing them better insight into the wants and needs of the institutions.

Perhaps Koester summed up the IT role for the future when she wrote: "[I]nformation technology will play a central role in the transformation of higher education, offering unimaginable opportunities and demanding unforeseen responses. . . . IT professionals can and should be at the core of envisioning and shaping the future of our colleges and universities."³ It is also important to remember that institutions must be getting the "right data" as opposed to just more "big data." No longer can data collection be just about education metrics, but rather should be about collecting and analyzing data that has been traditionally missing from higher education. As Busted noted, this means collecting data that allows for the voices of the consumers and constituents of higher education. This means tracking expectations, experiences, emotions, and outcomes of not just students but alumni, faculty, and staff in order to better understand how institutions of higher education are performing and how they can improve.⁴

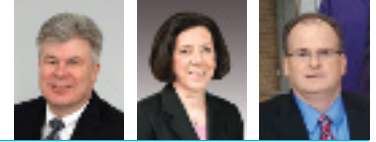
Community colleges are expanding focus from access to success. They are also looking beyond their own walls to strengthen their connections with local industries to create a more educated workforce. It will be necessary to track an entirely different type of student, that of the workforce development area. Business needs will have to be evaluated, and students who may not fit into the traditional "credit-bearing" model will have

to be tracked and accounted for in the future.⁵

As the IT workforce changes, adapts, and retools to address institution's technology needs and to address the challenges of student success, affordability, and accountability, IT leaders have to take on new roles as well. As Grajek noted, "the leader of the campus information technology and its applications needs to be a good communicator and salesperson for the internal changes needed, as well as have the ability to build teams and manage the broadening array of technologies."⁶

One example of the successful teaming and leadership of IT in relation to student success can be found at Montgomery County Community College in Pennsylvania. The institution has been ranked among the top community colleges in the country for its use of technology to support and enhance

The ability to not only impact student success models but to take leading roles in future success plans requires campus leaders to rethink their IT structures and determine the best ways to maximize IT potential.



By KEVIN POLLOCK, CELESTE M. SCHWARTZ, DAVID BUCK



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teaching and learning. Working with Achieving the Dream, data was utilized to assist with continuous improvement in the areas of first-year experience, student retention, graduation, and transfer rates. This was accomplished through the IT team working with decision makers to identify unmet data needs in areas such as enrollment management, student performance, institutional research, and ongoing program reviews.⁷

Another take on successful teaming of resources can be found at the University of Maryland University College (UMUC), where the president determined that analytics could assist with combating increasing competition for students, rising costs, and declining state support. He established a data analytics unit and housed it in the Office of Analytics, Planning, and Technology. A study of student enrollment behaviors noted that students who waited until the last moment to enroll were also at the highest risk of withdrawing or failing a course. This led the university to close enrollment four days prior to the first class and also allowed a grace period for students to withdraw without penalty up to four days after a class began. The results? Undergraduate completion rose by 7 percentage points over four years, while persistence rates increased by 4 percentage points.⁸

How else can IT connect with and improve student success models? Let's turn again to Montgomery County Community College (MCCC) and its focus on improving student access, success, and completion. In 2012, a grant from the Bill and Melinda Gates Foundation allowed MCCC to launch an Integrated Planning and Advising Services initiative. The initiative included an early alert system that allowed faculty to monitor progress and identify at-risk behaviors of students, an educational planning tool that allowed students the ability to map out entire degree or certificate programs, and a student dashboard that allowed students to go to a single source for their financial aid. As a result, the college saw increases in full- and part-time persistence for new and continuing students. In addition, the college experienced an 8% increase in persistence from fall to spring, and a 7% increase from fall to fall.⁹

Creating a more cohesive campus student success effort that includes IT isn't accomplished without bumps along the way.

Bowers describes the effort to connect student services and IT at the University of Southern California to improve their student success efforts. While key indicators such as persistence, timely graduation, and postgraduation employment or graduate school admission were in place, the ability to marshal forces within multiple departments and manage 25,000 undergraduate students was daunting. Record keeping alone was difficult. A lead IT manager worked with a senior associate registrar and an associate vice president of planning, assessment, and innovation to craft solutions. Challenges included the unfamiliarity with different sets of jargon and acronyms and the difficulty in managing shared ownership of such a large project. Bowers recommends having departments get to know each other better before working on large-scale projects, taking steps to have non-IT staff improve their own IT knowledge, communicating the work of various departments with their IT colleagues, and staying informed of work in the IT department. Basically, the more information that is shared between IT and other departments, the better the future outcomes are (Bowers, 2015).¹⁰

Without question, IT is starting to play a bigger role in student success models, and is also starting to become a bigger player at the table during strategic planning stages. However, more needs to be done. ■

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The Link to Content in 21st-Century Libraries

Content can seem largely invisible in today's 21st-century libraries. Especially after first-floor renovations, books and print journals are often hidden away on the unrenovated, musty upper floors of the library building and are unseen when people enter the facility. When libraries renovate or rebuild, significant portions of the library print collections are frequently removed from their shelves—to remote storage, compact shelving, or automated retrieval systems (ARS) in the library or off-site or occasionally to areas for disposal. Circulation statistics for print books are on a decline for most libraries while the use of digital collections soars.

If the old library brand was “books,” what is the brand today? Some college and university administrators are reluctant to fund library building renovations when access to digital collections requires no dedicated spaces. Why, then, are other higher education leaders spending money on renovations and additions to libraries if so much content is available in digital form, anywhere and anytime, from the devices of any campus affiliate?

At the 2017 Designing Libraries for the 21st Century annual conference, architect Craig Dykers asked the audience what he described as a rhetorical question: Are libraries places for *information*, with people in them, or are they places for *people*, with information in them? He concluded that ideally, today's libraries, as they have always been, are places for the interaction of people, knowledge, and technologies.¹ One reason that library renovations have brought record numbers of people into the physical building is that the notion of how people interact with content began to expand when available technologies were introduced to libraries in the 1990s. Two specific concepts motivated many of the changes in library spaces beginning at that time. First was the realization that libraries could become places for students and faculty to *create content* rather than places merely to *access content*. Second was an increased emphasis in higher education pedagogy on active, collaborative learning, in contrast to the traditional, passive lecture mode. These trends led to some pervasive changes in library space configurations, but sometimes the emphasis on information or content got lost along the way.

Linking Spaces to Content

Learning Commons

Learning commons spaces in libraries are intended as ideal venues for students to engage in active, collaborative learning. Furniture in open areas and enclosed group rooms is configured to invite small groups of students to work together, while

in-place technologies, access to power, and Wi-Fi provide an environment for students to create new kinds of information products in their assignments. The library-provided technologies often make it simpler for students to create presentations, develop websites, record podcasts, and edit videos, and the spaces encourage group work and collaboration.

However, many of these learning commons spaces do not appear obviously related to a library. In fact, more colleges and universities are adding informal spaces for collaborative learning—very similar to those found in library learning commons—to their new or renovated classroom buildings, student unions, and even dormitories. Should library spaces offer something unique? Why not highlight the links to information and content?

The renovation of the Cabot Science Library at Harvard University opened up sightlines of the building, and the designers and librarians made conscious decisions to showcase learning that is happening in the space. Through the use of digital screens and large windows facing onto a heavily trafficked area of campus, the library broadcasts its programs and workshops to participants inside the library as well as to observers outside. Passers-by can easily glimpse the eye-catching Discovery Bar, where demonstrations of new technologies and workshops take place. A recent event highlighted a project of 3D modeling of the Giza Pyramids. Similarly, Carol M. Newman Library at Virginia Tech showcases teaching and learning with technology through course exhibits and interactive displays on the main floor. Recently the library also hosted an exhibit that highlighted a crowd-sourced project for transcribing historical documents into digital form; the exhibit included a workstation where students could try their hand at transcribing, tagging, and connecting documents. These kinds of activities make clear the connections between physical libraries, digital content, and tools that can be used to create new knowledge.

Digital Scholarship Centers

Libraries increasingly are giving more thought to the connection between content and spaces when developing digital scholarship labs or centers. Describing these spaces, librarians often note that they intend to make the creation of new types of digital content visible to anyone walking through the library. For example, the suite of spaces incorporating a large video wall, a makerspace, recording studios, and teaching areas in Brown University's Patrick Ma Digital Scholarship Lab and Sidney E. Frank Digital Stu-



By JOAN K. LIPPINCOTT

dio are visible from the main library space through glass walls or in some areas are out in the open, allowing students and faculty to observe activities taking place in those settings. Greenhouse Studios at the University of Connecticut Library lives up to its name via its glass walls, which enable the academic community to view the digital scholarship work. In addition, some libraries, such as the Taylor Family Digital Library of the University of Calgary, display the products of digital scholarship labs on large screens, showcasing innovative projects and making the link between academic research and the library even more visible.

Cultural Heritage

Another means for differentiating library buildings from other campus structures is by telegraphing their cultural heritage mission. Libraries incorporate more than “information,” “data,” or “texts.” Often they also include analog and/or digital artistic representations. Libraries can make strong visual connections to cultural heritage by incorporating paintings, graphic art, sculpture, and digital art into their buildings. In the renovated Charles E. Shain Library at Connecticut College, for instance, a large graphic of a Kurt Vonnegut manuscript, produced by the author on a



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typewriter, has been made into an art installation in the stairwell. The manuscript is from a speech given by Vonnegut at the library dedication in 1976.²

Walking into the Buckeye Reading Room at the Ohio State University's Thompson Library, people see raised letters covering the floor in a pattern. A sign at the entrance explains the nature of this project: “The text is created by an alphabetic intersection and line-by-line weaving of three different accountings of world history that are arranged in a literary concordance.”³ In other areas of the library, brass plaques with words in various languages and alphabets are embedded in the floor. These art installations signal that this library values cultural heritage and has a deep relationship with language.

The 2016 renovation at the Virginia Commonwealth University (VCU) James Branch Cabell Library includes a large outdoor screen to “showcase art, animation, video and information about

scholarly work from throughout the VCU community.” University Librarian John E. Ulmschneider noted: “We hang art in our buildings to inspire students and give patrons something to reflect upon. This is just the newest way to do that outreach and education, and to showcase the diverse artistic and intellectual activity of our community.”⁴

Special Collections

Librarians are recognizing that their special collections (rare books, manuscripts, and archives) will distinguish them in the 21st century. Many institutions have put significant resources into digitizing portions of those collections, but library visitors are seldom aware of those projects. A small number of libraries are incorporating exhibits of this digital material in order to market this content and encourage its use. In addition, librarians could develop displays of digital projects created by students and faculty with content from the special collections.

The New Brand

Although it is no longer essential (in many cases) to access content in the physical building of the library, new environments can highlight the content lifecycle (creation, access, management, curation) for both e-content and analog content. The James B. Hunt Jr. Library at North Carolina State University is an exemplar in this regard. Its many digital displays showcase data visualizations, artistic representations of information, digital book displays on selected topics, information on policy issues such as open access, and more. A large window allows library users to see the robotic book storage system in operation, accompanied by a visual search system for books. The Hunt Library, designed by Dykers's firm Snøhetta with the collaboration of Vice-Provost and Director of Libraries Emerita Susan K. Nutter and her staff, took every opportunity to make visible its digital collections, staff expertise, technologies, and collaborative work spaces.

In the digital age, college and university libraries can showcase digital projects and the potential that technologies plus content provide for the expansion of knowledge. By doing so, libraries demonstrate they are places that connect people with content. This link is the library's new, 21st-century brand. ■

Notes

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The Top 10 IT Issues and the Future of Learning Logistics

I love top 10 lists. Really, top any-number-of-items lists are great. Information is so hard to quantify in a meaningful way, but listicles (the technical term for these lists) always seem to do the trick. There is something reassuring about knowing in advance how many “somethings” I’m about to learn and about realizing that any boredom caused by any one item can be quickly relieved by the next item on the list. And I’m always suckered by the clickbait links that proclaim: “You’re not going to believe #4!”

The EDUCAUSE Top 10 IT Issues list is no exception. This list tells an interesting story that reflects the collective concerns of the higher education IT community. However, the 2018 list tells this story differently. For me, the story is not about what’s on the list but, rather, what’s not. *Learning technology* (in various phrasings) has been a recurring item on the EDUCAUSE Top 10 IT Issues lists every year since 2000 except for two: 2012 and 2018. Does the fact that supporting teaching and learning didn’t crack the top 10 suggest something about higher education information technology?

Possibly not. It’s important to recognize that we have hit a saturation point where teaching and learning has reached such a level of strategic importance that putting it on a list of things to worry about seems to somehow downgrade its importance—as if it is simply one more to-do item on the IT grocery list of issues. “Let’s put transforming learning on the list—right below milk, eggs, and bread.”

In other words, *how do we talk about IT issues involving teaching and learning when teaching and learning is at the heart of every IT issue?*

For generations, the basic structure of higher education has been divided into courses—each a combination of faculty, students, classrooms, and textbooks. This combination is replicated as an independent transaction with students thousands of times, with a rinsing-and-repeating between semesters. In recent decades, information technology has helped make this process more efficient through technical infrastructure.

Changing expectations from students, new learning modalities, and emerging technologies now challenge this fundamental combination. These intersecting forces create a new opportunity to reframe IT efforts and use the institution’s diversity and scale as an asset—something I like to describe as *learning logistics*.

Learning logistics is about developing an intelligence used

to design the best possible, always-on student experience. It isn’t about a generalizable one-size-fits-all approach to education. Rather, learning logistics is based on a smart foundation that supports our best teachers and empowers creativity in our students. When looking at this year’s Top 10 IT Issues, we can see the leading indications of how learning logistics is changing culture, policy, and understanding on campus.

Among the most obvious examples of learning logistics is the use of data to help students be successful (Issue #2: *Student Success*). Analytics has been a long-discussed innovation within higher education; however, it still has far to go. Using data to help predict student success so that we can intervene with struggling students often consumes conversations about analytics. While essential, using data to empower learning isn’t just about students who struggle. By taking advantage of the ambient data that resides with increasingly complex and intertwined online technologies (Issue #8, tie: *Digital Integrations*), we can lift all students—especially by raising ceilings for those who may be disengaged but capable of doing more.

The trend toward effectively using data to enable student success also leads us to use data to explore learning design. Artificial intelligence (AI) and machine learning are topics of emerging importance. Nearly everyone comes into contact with AI and machine learning technologies on a daily basis, ranging from the way that Netflix uses our TV-watching habits to provide recommendations to the sometimes comedic auto-corrections our smartphones make while sending text messages. The technologies that make these interactions possible can also be used to take on some of the greatest challenges facing the development of open educational resources.

Taking advantage of the increasingly integrated learning management, content, and assessment environment makes it possible to develop tools for reducing the time and effort needed to develop content. Leveraging machine learning technologies that can discover relevant content, construct textbook alternatives, and craft effective assessments is clearly on the horizon of learning technologies that can reduce the cost of attendance for students (Issue #6: *Higher Education Affordability*).

In addition, we can’t discuss the student experience without exploring space. Many classrooms are still designed largely to

When looking at this year’s Top 10 IT Issues, we can see the leading indications of how learning logistics is changing culture, policy, and understanding on campus.



By KYLE BOWEN



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solve the same scarcity problem present in a one-room schoolhouse—that is, to match the number of students to the number of seats. This is an institutionally-focused view of a complex numbers problem. With thousands of courses and thousands of students, how do we make it all fit?

Again, thinking about the scale and diversity of the institution, we can reframe the thinking about classrooms as well. We can do so by transitioning into a mode where “fit” doesn’t mean the right number of seats but, instead, the best possible space for the intended learning outcome. Looking across higher education, we can already see great examples of this shift. Makerspaces are an increasingly popular innovation on many campuses. We can also see examples of immersive experience labs and design studios that attract students from a wide variety of disciplines. In these cases, spaces were designed to engage students in very specific experiences (Issue #5: *Student-centered Institution*). Our opportunity is to expand this thinking to include an even more diverse collection

of activities, ranging from performance art to escape rooms. We can challenge the traditional assumptions that we make about classrooms: Why are classes held in the same place, with the same group of students, with the same instructor?

Data analytics, machine learning, and learning spaces are just a few examples of how learning logistics has become so infused into information technology that it’s impossible to tease the technology apart from anything else that we do. This is an important advancement for sure, but what’s more important is that we realize this shift has happened—that we don’t become so fixated on technology that we lose our focus on the mission. Rather, we need to use technology to expand great experiences without killing the magic that made it possible in the first place. ■

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Accessibility: A Shared Campus Responsibility Best Accomplished with Executive Support

Those of us who are members of the EDUCAUSE IT Accessibility Constituent Group have spent considerable time discussing the importance of the strong executive leadership and planning needed to support the accessibility policies and campus accessibility planning required for compliance with disability legislation. Without planning and leadership, a college or university could find itself among the approximately 400 institutions being targeted—by the activist Marcie Lipsitt—to fix their websites.¹ As a result of some of her complaints, the Office of Civil Rights (OCR) has pursued resolution agreements.

This type of complaint is part of the changing landscape of disability litigation. I believe it reflects the growing frustration of individuals with disabilities who are still experiencing barriers to access based on the web applications and ICT (information and communications technologies) lack of accessibility compliance as outlined in the Web Content Accessibility Guidelines (WCAG). Past complaints are listed within the *EDUCAUSE IT Accessibility Risk Statements and Evidence* document.

People become frustrated when web applications contain barriers to their participating fully as members of the campus community. It is not sufficient to depend on the individualized services provided by disability services offices as accommodations. Faculty, staff, students, and the public want and need access to technology as outlined in WCAG 2.0 AA. When these standards are met, basic access to technology is more likely to be available without the need to go through a services request. Not every individual with a disability self-identifies as needing an accommodation when much of what is needed could be provided when accessibility standards are met. In addition, people access web applications during nonbusiness hours, and therefore accommodation services may not be available. If web applications are designed with the WCAG 2.0 AA standards as part of the quality assurance process, many users would have access without having to depend on disabilities services professionals. The disability services office would then be able to focus on providing accommodation services when accessibility is not possible up front or when a more prescribed accommodation service is needed.

While we await technologies that are 100 percent accessible, we

must proactively work to obtain the most accessible products for users, and we must be ready to assist students with individualized accommodation services. This means as technology is selected, vendors need to be accountable for meeting the accessibility standards to which higher education programs and services are held. Software and hardware development models should blend accessibility compliance testing into their quality assurance evaluations. It is challenging to strike a balance between (1) creating, purchasing, or adopting the most accessible products and (2) meeting the business needs of institutions that are striving to capitalize on the advantages of new technologies. Yet based on the application of current international accessibility compliance standards, technology products can be made largely accessible to all users.

Strong executive leadership and planning is needed to support the accessibility policies and campus accessibility planning required for compliance with disability legislation.

All members of a campus community should know and understand their role to support accessibility compliance in their everyday work life. Most do understand how important it is to create and maintain a community that does not discriminate on race, religion, age, gender, or sexual orientation, but at times it seems that understanding how to avoid discrimination against an individual with a disability is overlooked or misunderstood. Realizing that accessibility is a civil right may require more training for campus communities.² Most institutions do not require training in accessibility-related rights—as they do with sexual harassment or information security. Perhaps that can change as we work to provide a more acces-

sible, inclusive campus community for all students, staff, faculty, and the public.

What is needed to assist institutions in improving accessibility compliance is a clear campus accessibility policy, operationalized with procedures and plans with strong support and communication among executive leadership.³ One best practice is to create an executive steering committee made up of campus administrators including the president, the provost, the CIO, and vice presidents to provide regular communication and ensure adequate resources in support of an accessibility policy implementation. The California State University's Accessible Technology Initiative (ATI) implementation is using this as a guiding principle. Reporting up to the executive committee are subcommittees and working groups that are tasked with the implementation of goals and objectives. These subcommittees



By SUE CULLEN

should comprise key stakeholder groups and include members with appropriate experience and expertise to inform decision-making. For example, to implement accessibility standards into the procurement process, procurement contract experts would work with IT experts and available accessibility experts.

However, accessibility professionals are not typically plentiful. Efforts are under way to expand the pool of accessibility professionals and to recognize what skills are needed to educate students to develop technologies that are accessible, usable, and meaningful to everyone. Two such entities are the International Association of Accessibility Professionals (IAAP), which provides networking, education, and certification for accessibility professionals; and Teach Access, which works to help identify and address the common challenges of preparing designers, engineers, and researchers to think and build technologies embracing all types of users to develop accessible, universally designed products.

As awareness builds, it is critical to reach beyond the accessibility professionals for support by building capacity to deploy role-based skills training for staff across the campus. Proactively providing institutional capacity for individuals to learn the skills to incorporate accessibility into their job responsibilities and descriptions and overall business practices is critical. These skills would also be applicable to the adoption, creation, or purchase of instructional materials and web applications. Members of the campus community who select instructional materials and web applications could expand the selection criteria for products to include accessibility compliance (e.g., looking to see if the product is keyboard-accessible and functional without the use of a mouse and communicating the accessibility policy and WCAG to the product creator).

Such a large-scale campus endeavor requires project management in order to achieve success in changing behaviors and business practices to reach the goals of any campus accessibility plan. Without executive buy-in, resource allocation to support the business objective will not be allocated. For example, without funding for training or budget allocations for captioning and audio description, progress cannot be made. While many good ideas can come from a bottom-up approach, budget allocation support is top-down. Good implementation of an accessibility policy may seem costly, but when these objectives are not acted on and accessibility is not achieved, the possible outcome from a complaint can be very costly in human resources and funds. OCR resolution agreements have included a short timeline to achieve accessibility compliance including creating an accessibility policy, conducting internal and external audits, remediating barriers, developing and deploying training programs, and hiring appropriate accessibility professionals. Building a strategic accessibility campus plan proactively could help an institution avoid being placed in the position of having one imposed upon them.

As higher education institutions build their capacity and communicate accessibility compliance requirements to vendors, a space for collaboration and interaction to improve vendors' understanding of campus business needs and accessibility stan-

dards can be achieved. This can result in improved levels of accessibility and support within a product. The deeper exploration and collaboration with vendors may lead staff to identify and share with the vendor various feature requests that, when accepted, will allow the product to be more usable by everyone. This can occur while still expecting vendors to train their developers/designers in accessibility standards. Institutions should look for companies with a strong quality assurance program that includes knowledge and accessibility standards training.⁴ Designing products based on the elements of universal design principles⁵ and accessibility compliance standards will allow users to more fully interact with the functionality of a product. Vendors also find it difficult to identify and hire designers, engineers, and developers with accessibility coding expertise. The Teach Access collaboration network of industry, academia, and advocacy groups works to identify methods to incorporate accessibility standards into educational opportunities for classes such as web development and design.

Establishing executive-supported subcommittees for the accessibility compliance of instructional materials, procurement, and ICT is important as a way to divide up the project plan into manageable pieces, but none of the subcommittees can work independently. Simultaneous collaboration across all areas is critical.

To achieve the cultural change necessary to support accessibility and universal design principles and standards, a cross-functional approach is needed. This requires shared campus responsibility. Not all products meet accessible standards, and accommodations still need to be provided for particular situations; the goal is to avoid having the accommodations process as the first response to overcoming accessibility barriers for an individual using a product. At times, an equally effective and meaningful alternative access plan can provide a temporary solution while a vendor works to remediate accessibility barriers. Temporary solutions like this will have to be planned for and agreed upon by cross-functional teams until more accessible products are found to be commonplace—or until legislation changes to hold creators of ICT products accountable to WCAG standards. Until then, we can continue to communicate to our vendors the need to adhere to accessibility standards, and we can work internally to support an inclusive campus community. ■

Notes

1. Peter Schmidt, "One Activist Has Hundreds of Colleges Under the Gun to Fix Their Websites," *Chronicle of Higher Education*, July 6, 2017.
2. See Art Morgan, "Accessibility as a Civil Right," *EDUCAUSE Review*, January 25, 2016.
3. For example, see "Policy at the CSU," "Goals and Success Indicators," and "Executive Support," *CSU Professional Development for Accessible Technology* (website).
4. See "Vendor Accessibility Requirements," *CSU Professional Development for Accessible Technology* (website).
5. See "About Universal Design for Learning," CAST (website).

Sue Cullen (scullen@calstate.edu) is Assistant Director, Accessible Technology Initiative, for the California State University Office of the Chancellor.

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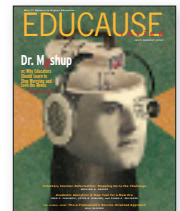
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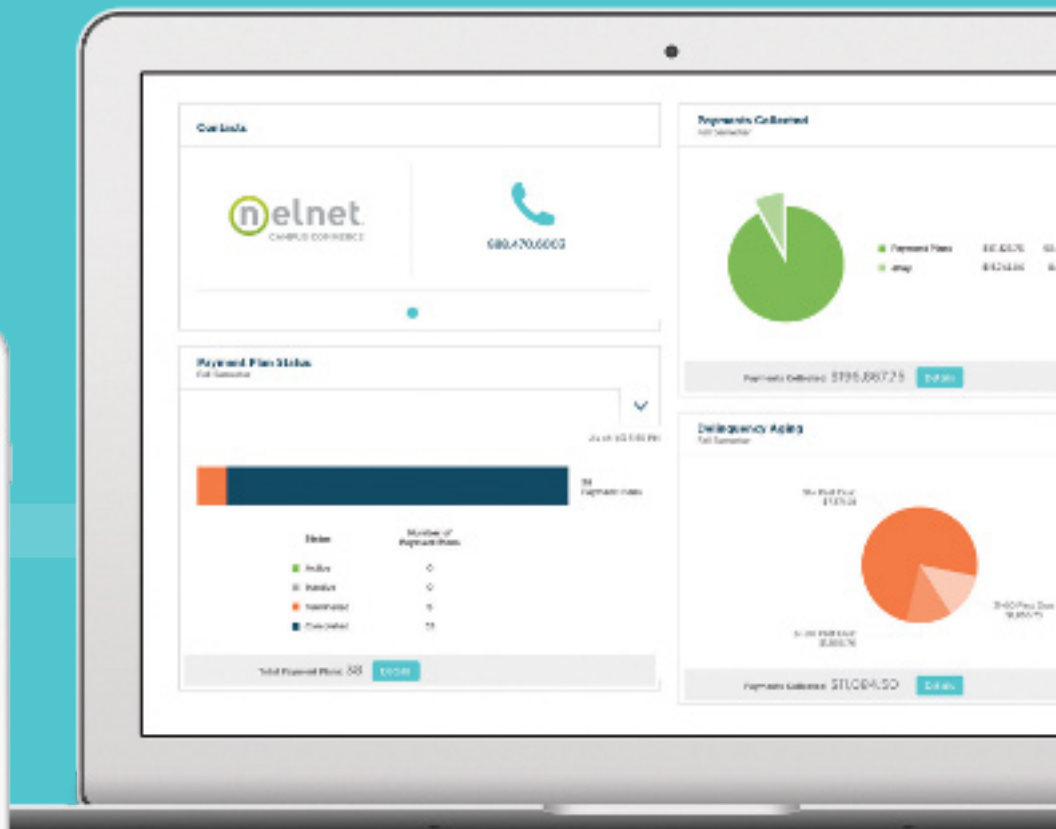
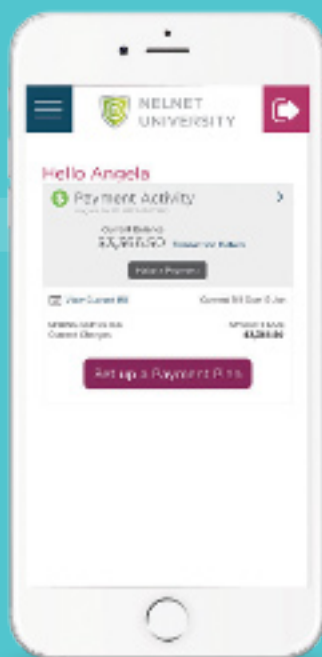
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