EAB | Campus Leadership Brief

Who Should Read

President's Cabinet
Deans and Administrators
IT Directors and Staff

Integration

What it is, and Why it Matters for Higher Education

Concept in Brief

Integration is the process by which diverse technologies are enabled to communicate. Higher education technology ecosystems rely heavily on the resources and services of their institutional IT organizations to enable seamless connections between the many campus systems and applications.

Increasing Tech Awareness on Your Campus

As technology's role in the educational mission expands, higher education stakeholders are increasingly required to speak the language of IT.

In this series, EAB's IT Forum leverages our extensive footprint in the higher education community to lift up technical concepts for executive consideration. These documents will enable campus leadership to advance strategic goals with a shared understanding of associated technological challenges.

Technology Deluge Shows No Signs of Slowing

Growth in Technology Hardware, Software, and Student Service Demand in Higher Education

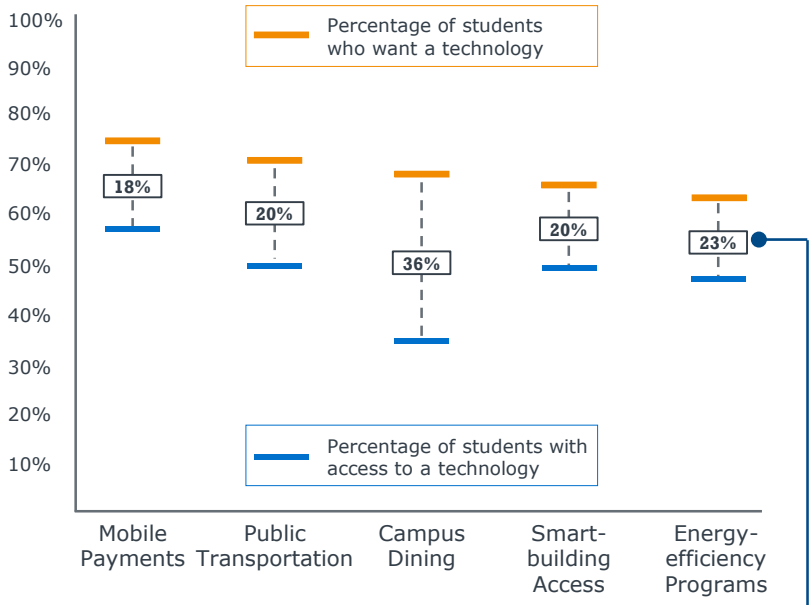
Despite the rapid adoption of technology across campus, university and college offerings continue to fall short of student expectations. As higher education institutions respond to the growing need, attempts to keep pace with digital innovations will bring new technologies into diverse corners of every college and university.

The Modern Campus Already Runs on Tech…

- Teaching and Learning Initiatives
- Student, Faculty, Staff Device Proliferation
- Campus Unit Workflow Automation
- Digital Engagement and Marketing Efforts
- Campus Performance Analytics and IR

… But Students Are Looking for More

Advanced Technologies Currently Available, Versus Desired[1]



Significant gaps between student desires for "digital" technologies and current campus provisions show higher education has a long way to go to meet expectations.

1) Wakefield Research Survey for Ellucian, N = 1000.

Source: EAB interviews and analysis; "Students are Looking for Personalized Digital Experiences: Does Higher Ed Deliver?" Ellucian (2017), http://www.ellucian.com/White-Papers/Students-are-looking-for-personalized-digital-experiences/.

Technology Underpins the University's Diverse Missions

Competitive Institutions Increasingly Rely on Strategic Campus Technology Acquisitions

From declining enrollments and state budgets to the complexities of a digital, globalized economy, higher education has suffered under growing economic and demographic pressures. Like students, many campus leaders turn to new technologies to diagnose and respond to these various institutional challenges.

Complex Questions Around Campus...	**... Prompt Technology Investments to Diagnose and Address Cross-Silo Campus Initiatives**		
How do we promote **digital skill development** for our graduates?	1	1. Relationship building with industry partners	2. Technology literacy training on campus
How do we balance **budgets** in an increasingly tight market?	2	3. Spend analytics 4. AI-enhanced marketing	5. Smart scheduling and space optimization 6. Scaled solutions
How do we improve graduation rates and ensure **student success**?	3	7. Smart advising and campus analytics	8. Tools and platforms for flipped learning
How do we support **global research collaborations** for our faculty?	4	9. State-of-the-art research computing facilities	10. Secure remote access and sharing capabilities

Source: EAB interviews and analysis.

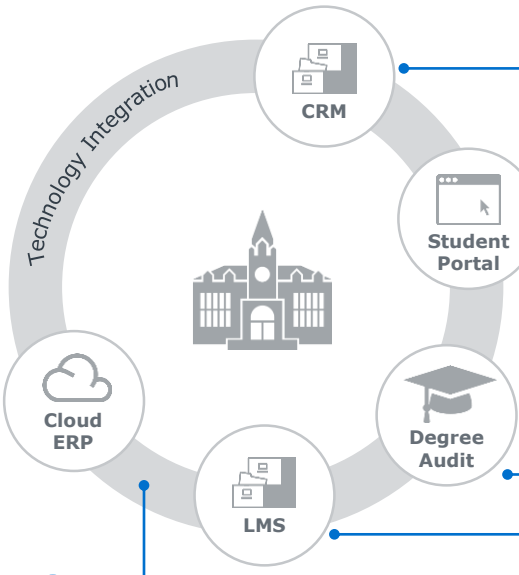
Integration: Connecting the Dots

Helping Technologies to Communicate Effectively is a Resource-Intensive Process Managed by IT

Integration is the process by which diverse technologies are enabled to communicate. In the absence of industry-wide standards and vendor collaboration, higher education technology ecosystems rely heavily on the resources and services of their institutional IT organizations to enable seamless connections between the many campus systems and applications.

Different Technologies Inhabit Diverse, Incompatible Environments

Creating a Cohesive Technology Ecosystem Means Connecting the Dots



1. Most software technologies used by campus require large amounts of data to operate (e.g. user email addresses, student IDs, performance data) and create more data through usage.

2. A number of factors affect any given technology's communication capabilities. For example, the age of the technology, how it was developed, who accesses it, and whether it is installed on campus or hosted in the cloud.

3. For technologies that need to share information, finding a way for them to communicate requires negotiating the requirements of each system independently and building a translation mechanism to work between them.

4. Facilitating information exchange across different technologies often falls to campus IT staff. When new technologies are first introduced, initial data is supplied from existing systems, but has to be transformed to the new "product-specific" format. If data in a campus application is considered valuable for insights, that data must then be drawn back into the institution in a format that is consistent with other technologies and data standards.

Highly-Trained Developers Working Hard Behind the Scenes

Integration Work is a Resource-Intensive Exercise

$125K
Average salary of one senior developer

1 month
Average time spent on building a single new integration

35-50%
Of IT resources spent on building and maintaining integrations

Source: EAB interviews and analysis.

Today's Processes Ignore Tomorrow's Technology Needs

Most Institutions Build Integrations to Meet Short-Term IT Project Demands as Quickly and Cheaply as Possible

Most institutions' integration efforts center around individual technology products or IT projects. For every project, IT staff follow the same process: working with sponsors to understand needs, building the necessary integration solutions, and then maintaining interoperability. Pressures from project sponsors and project backlogs often lead IT staff to build the fastest solution that meets the immediate needs of the project. Little consideration is given to how the integrations will affect the broader institution, either now, or in the future.

Implementations Prioritize Current Project Requirements, Leaving Campus Underprepared for Future Needs

✓ **Sponsoring business unit sets project requirements and scope**

Units determine the implementation particulars, including capability and module adoption, data descriptions, and storage agreements

✓ **Sponsors and IT prioritize low-cost, quick-to-deploy implementations**

Units want to use their new tools and IT wants to move on to the next project, meaning that suboptimal processes are often used for integration efforts

✓ **Focus on the tool and problem at hand drives blind adoption of vendor models and standards**

Project sponsors invested in the functionality of particular tools pay limited attention to future complexities and data longevity

✗ **Limited ability to scale successful technologies across the rest of campus**

Unit-based data silos and bespoke data ontologies, as well as idiosyncratic process customizations, make it difficult to expand the use of the tool in other areas

✗ **Direct integrations rarely provide the seamless user experiences that users demand**

Minimal-cost integrations usually move data directly between systems sporadically, with no functionality for real-time communications to improve digital experiences

✗ **Overinvestment in vendor models further fragments campus's data and processes**

Disparate data standards linked to vendor tools complicate analytics efforts and reduce inter-vendor agility in the event that functionality is not as expected

A Case of Implementation Regret

1. Business leaders forego real time integration during library payments system installation
2. New registration tool acquired to allow online class enrollment for all students
3. Student outrage at late registration fees when library payments don't appear automatically in portal

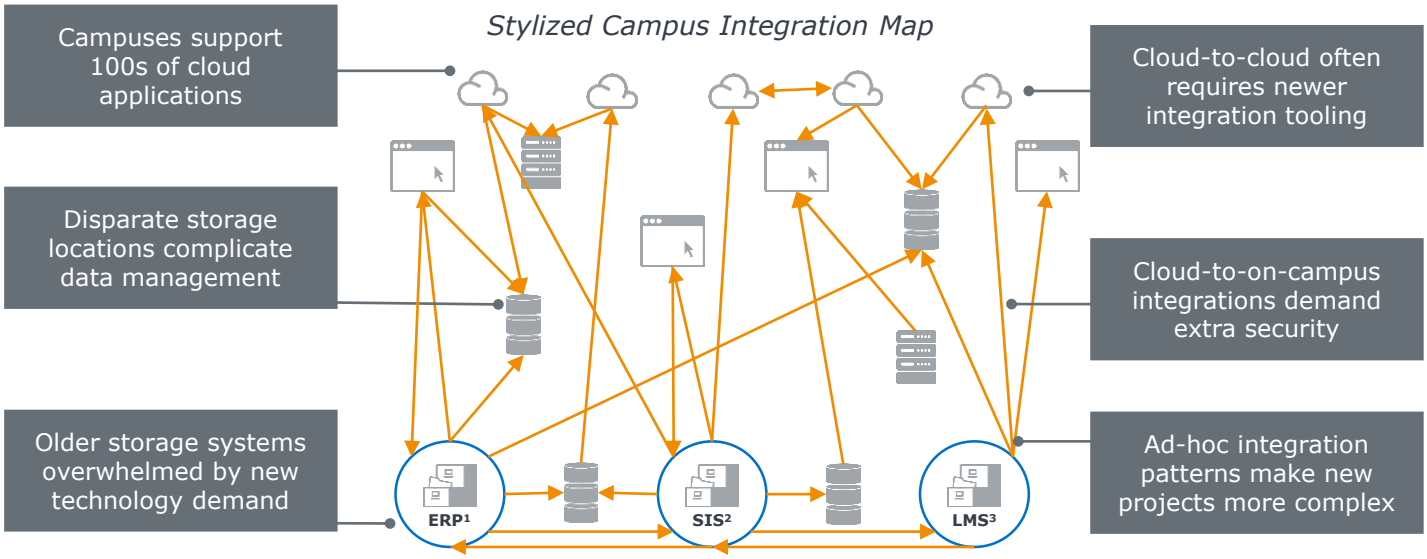
Source: EAB interviews and analysis.

Long-Term Costs in Risk, Maintenance, and Opportunity

Tack-On Systems, Shadow Storage, and Spaghetti Connections Increase Ongoing Costs and Complicate New Initiatives

For every integration project, IT staff develop communication techniques to fulfill the needs of the particular solution. Oftentimes, this requires developers to build workarounds and "quick fixes" to meet deadlines and technology standards. For example, developers will add new storage solutions, move data between systems in excel files, or settle for suboptimal integration patterns. After decades of this approach to IT, institutions are left with complicated IT environments which are hard to navigate and increasingly difficult to change.

Complex IT Environments Increase Costs, and Make Innovation Harder



Higher Risk

Changing or updating individual components triggers breakdowns in communication

When systems (e.g., the ERP) are changed or updated, the data formats they feed into other applications may change; many connections will break, and must be updated accordingly.

Greater Cost

Growing numbers of connections require a growing proportion of resources

Adding more technologies means adding more connections, which in turn increases the time needed to monitor and maintain those connections as part of a functioning IT ecosystem.

Lower Impact

Leveraging data for insight generation is increasingly onerous

With a growing variety of data and technology standards spread across campus, bringing the information contained within them together for analysis grows more time consuming.

1) Enterprise Resource Planning System
2) Student Information System
3) Learning Management System

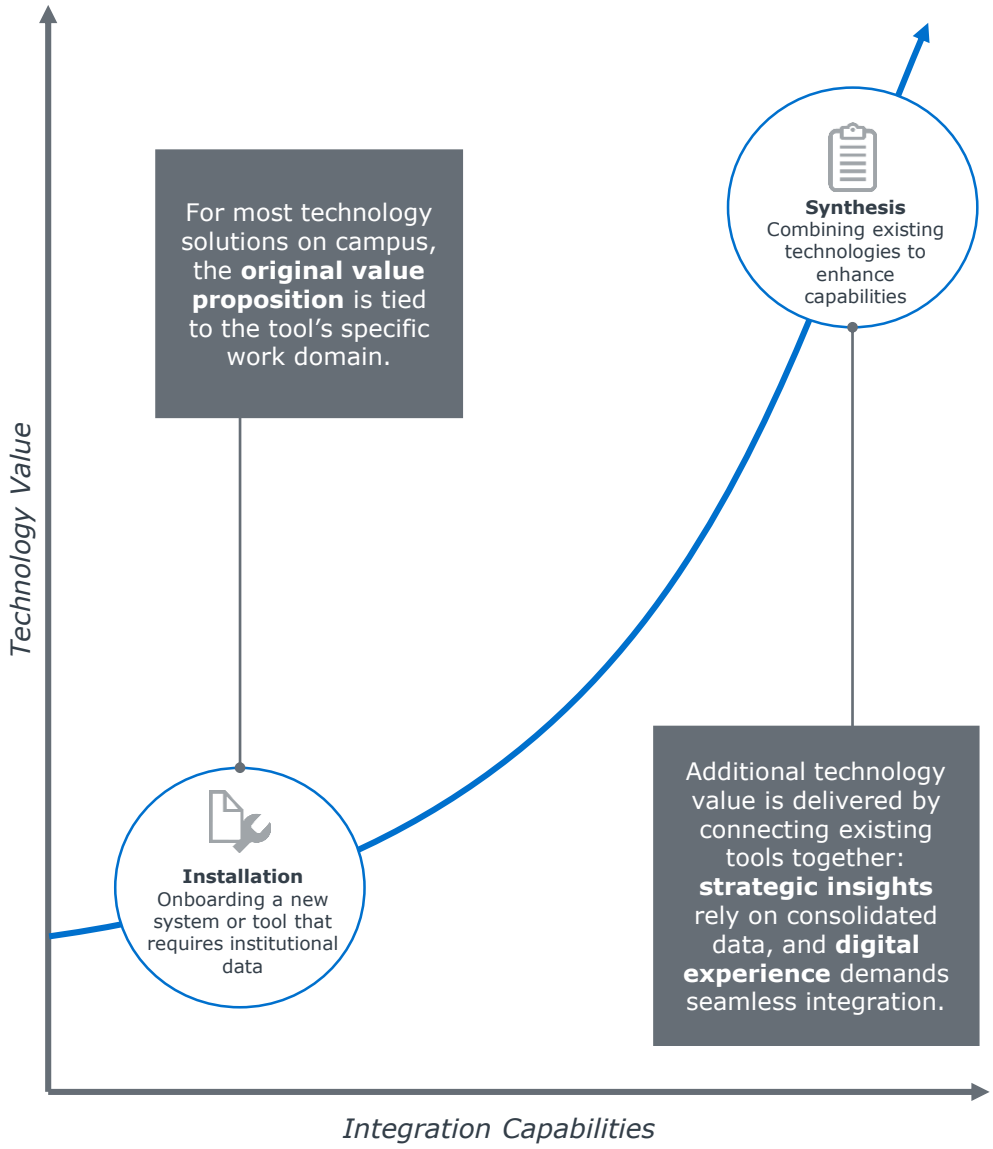
Source: EAB interviews and analysis.

Future Capabilities Depend On Advanced Integration

Synthesizing Campus Technologies is Key to Realizing Long-Term Return-on-Investment

As more "best-of-breed" software solutions and hardware components are brought into the campus ecosystem, their value is no longer defined solely by their success within a particular domain. Solutions that can function seamlessly as part of the enterprise and contribute their data flexibly to the institutional mission and its changing strategic imperatives, are exponentially more valuable to campus strategy.

More Flexible Integration Drives Ongoing Value



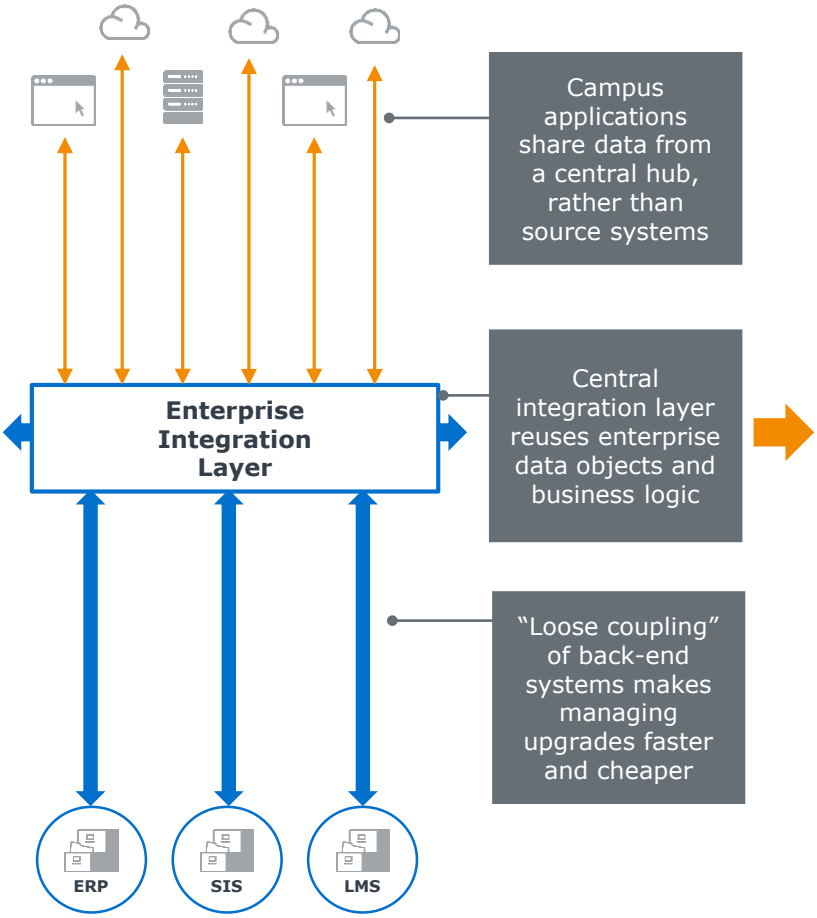
Source: EAB interviews and analysis.

Improved Integration Supports Far-Reaching Institutional Success

Future-Focused Integration Strategies Simplify Technology Connections to Promote Flexibility and Consistency

Integrating for the future means planning for change. To stay afloat in an evolving digital world, campuses must opt for fewer direct connections between technologies and fund shared central integration and data capabilities. By simplifying integration patterns and centralizing data standards, campuses can limit disruption during periods of technology flux, and increase the cross-campus value of individual investments.

Simplified "Hub and Spoke" Patterns Reduce Complexity and Improve Cross-Campus Digital Initiatives



Improved Data Quality

Enterprise data reuse mitigates proliferation of data silos, improving consistency in analytics efforts

Freedom to Change Vendors

Having fewer connections minimizes rigid interdependencies, making changing solutions a simpler, less costly endeavor

Quick to Scale

Centralized data and business logic helps IT to scale solutions across different areas of the institution with similar needs

Better Security

Simplified integrations are more easily secured with campus-wide protection and access management tools

Capture Cost Efficiencies

Repeated integration patterns are easier to monitor and update, making them cheaper to maintain than ad-hoc efforts

Source: EAB interviews and analysis.

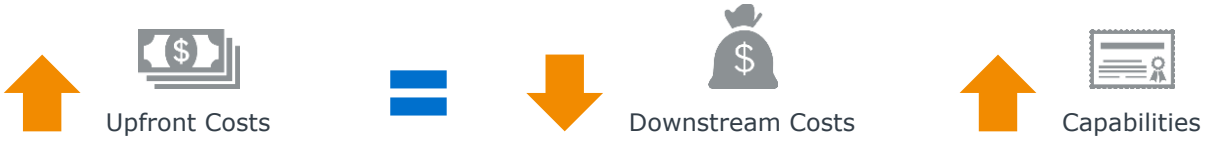
Investing in Integration Pays Dividends Down the Line

Increasing Upfront Resources for Integration Work Multiplies Ongoing Technology Value, Builds a Connected Campus

Undoing years of historical integrations and updating to newer, more flexible patterns takes a concerted effort. IT teams must rationalize existing data flows, as well as invest more at the point of installation for new technologies. Campuses must cooperate during IT project prioritization and development to fund enterprise-focused implementations that build and enhance future digital capabilities, rather than focusing only on the tool at hand.

"Quick and Dirty": Project-Focused Integration

A Better Way: Enterprise-Focused Integration



Upfront Costs	Downstream Costs	Capabilities
The resources involved in **installing and integrating new technologies**, including dollars and FTEs.	The resources involved in **maintaining** campus technologies and facilitating **interoperability**.	The **IT and business functionality** derived from the new technology and its onboarding process.

Case in Point: Introducing API[1] Integration at Northwestern University Leads to Reduced Maintenance Burdens and Explosion of Student-, Staff- and Faculty-Facing Capabilities

Higher Investment

~25%

Additional up-front resources expended to master and support new integration methodologies

Reduced Operational Cost

100x

Direct, one-off integrations replaced by shared and reusable web services

Increased Campus Capabilities

40 APIs

Now expose innovation-friendly, standardized data to authorized users on campus

1) An API (or Application Programming Interface) is an internet-based messaging protocol that allows systems to communicate specific data components in real time.

Source: EAB interviews and analysis.

Integration Strategy is a Campus-Wide Collaboration

Institutional Progress Driven By Leaders Within and Beyond the IT Organization

While IT can define best practices, desired integration end states, and a roadmap to drive change, achieving progress relies on collaboration with business units during technology implementation projects. Leaders from the business and IT should maintain focus on enterprise technology needs, both now and in the future.

Campus Leaders

Consider Enterprise Needs with Every Solution

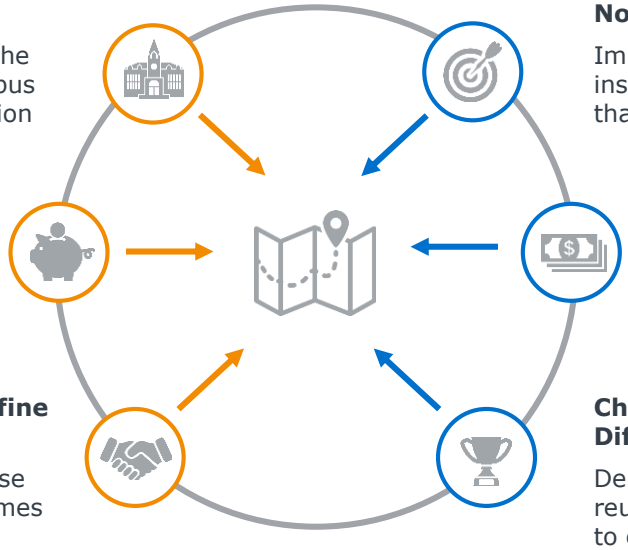
Invest in technologies with the capacity for use across campus to improve enterprise cohesion

Invest in Tomorrow While Building for Today

Bear upfront costs to build downstream capabilities and prepare for changing needs

Collaborate with IT to Define Project Requirements

Dedicate operational expertise to IT projects to align outcomes with campus needs



IT Organization

Focus on Enterprise Services, Not Technology Systems

Implement solutions to support institutional capabilities, rather than to adopt particular tools

Make Total Integration Costs Transparent

Quantify risks and benefits across integration scenarios to improve decision-making

Champion Reusability Across Different Organizational Silos

Deploy integration services with reusable logic, patterns, and data to capture IT service efficiencies

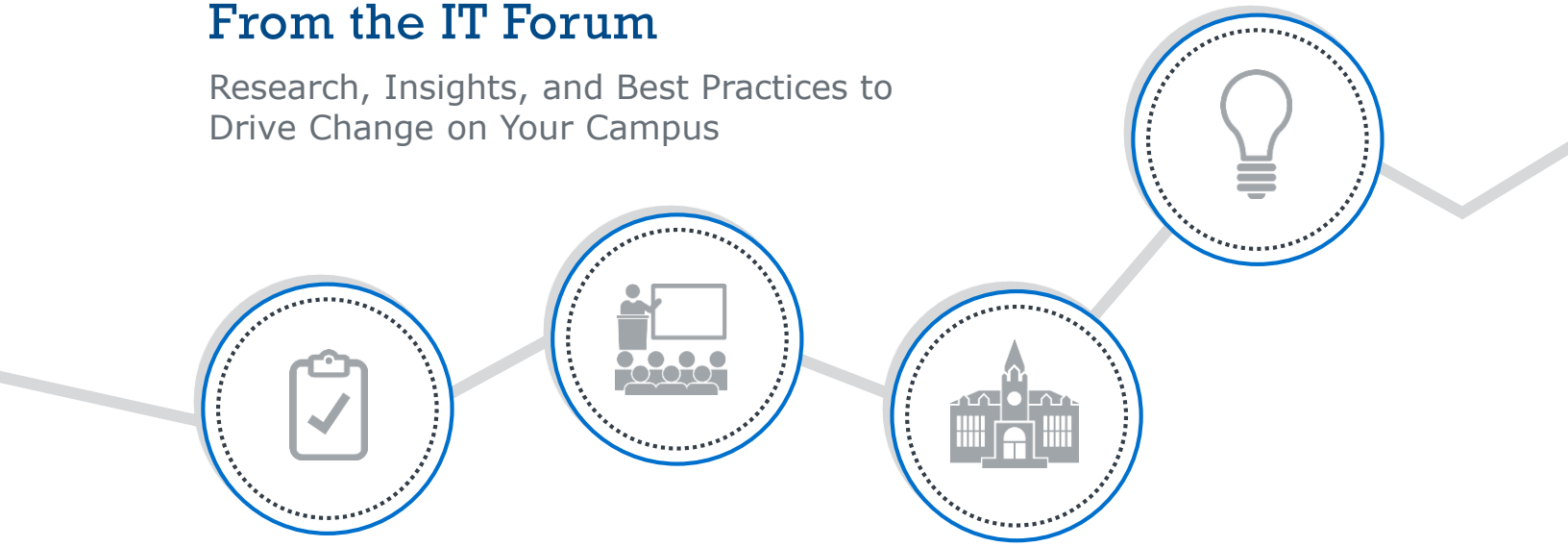
Inaction is Complicity

> Building the foundations for success in the digital era is a team sport. What's happening now is a **classic tragedy of the commons**. Anyone who's pushing for innovation independently, ignoring that campus-wide need, is endangering the institution's ability to leverage our investments moving forward.
>
> *Assistant Vice President and CIO*
> *Private Research University*

Source: EAB interviews and analysis.

More Resources From the IT Forum

Research, Insights, and Best Practices to Drive Change on Your Campus



1

Read IT Forum Executive Briefs for best practice research and insights

IT Forum resources are available to everyone with a member campus email address. Head to eab.com/itf for our library of best practice research, including executive briefings on integration, data governance, and higher education digital strategy.

2

Schedule an expert call, or private campus webinar

Researchers from the IT Forum are available on-demand to take a deep dive on any of our resources. We can walk your cabinet, committee, or IT team through any of our research via conference call or private webinar. Contact research@eab.com, or your institution's Relationship Manager.

3

Bring us to campus

Whether you're looking to foster cohesion across campus leadership or build consensus for change within IT, bringing an EAB presentation to campus can help you kick-start strategic initiatives with the context and direction of EAB's breakthrough practice research.

4

Jump straight in with our Practice Implementation Intensives and toolkits

IT Forum researchers distill our best practices into maturity self tests, implementation templates, and working group discussion guides to fast-track turning research into results on your campus. All of our PIIs are available to download online, at eab.com/itf.

Source: EAB interviews and analysis.

IT Forum

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