

# Managing Data Risk in Student Success Systems

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*EDUCAUSE IPAS Summit Report*

February 2014

**EDUCAUSE**

## EDUCAUSE IPAS Summit

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## **EDUCAUSE IPAS Resources**

Resource Library for Student Success and IPAS  
Integrated Planning and Advising Services Research Hub

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## Executive Summary

Student success has come into sharp focus for higher education. New models have emerged in response to outcome-based funding at the state level and a completion agenda at the national level. Integrated planning and advising services systems show promise for improving student success and college completion rates, but IPAS use of student and institutional data is not risk-free. Higher education must consider the key issues of privacy, security, and data governance in deploying and operating these systems.

In pulling data from information systems to support student success initiatives, what data-related risks should we consider? Conversely, what opportunities might we miss if we *don't* harness student data? Thinking ahead about the data needed and its uses, as well as establishing who has access, is key to developing and implementing effective IPAS solutions. All key stakeholders should be included in determining IPAS architectures and identifying data safeguards: information security and privacy officers, legal counsel, technology officers, student affairs and academic affairs leadership, faculty and staff advisors, and others in traditional student success roles. Likewise, more input is needed from end users—advisors, tutors, and students—about what works.

Many institutions have considerable amounts of *data*, but *information* is less common. The challenge is to turn data into a productive resource. No single model or approach will fit all institutions and their students when implementing IPAS systems, and leaders must achieve a delicate balance between guiding students to degree completion and allowing them the flexibility to experiment, explore, and make decisions about their education.

## Introduction

Emerging integrated systems for capturing, combining, and analyzing student data and academic program information are sometimes called *integrated planning and advising services* (IPAS). These systems and service models are designed to provide students and advisors with personalized guidance on how to effectively pursue students' academic goals and navigate their academic careers. They rely on the collection and management of a range of data that are relevant to student success. These data may include Family Educational Rights and Privacy Act (FERPA) protected elements like grades, personal identifiers that help track students across systems or institutions, or data that, while not regulated, should still be considered highly confidential. While IPAS systems hold promise for improving student success and college completion rates, their use of student and institutional data—as with any data collection and use—is not free of risk. Beyond the effectiveness of these systems and services, institutions must consider issues of privacy, security, and data governance, for example, in deploying and operating them.

In November 2013, a group of 32 invited academic, privacy and security, technology, administrative, and student support leaders gathered in Washington, D.C., for a one-day summit. The group, supported by the Bill & Melinda Gates Foundation, met to explore issues associated with managing risk in student success systems and to identify opportunities for encouraging the development of these systems. Specifically, summit participants were asked to:

- Identify internal and external drivers that encourage the adoption of IPAS
- Identify institutional risks to IPAS adoption, document effective practices, clarify existing solutions, and determine whether new solutions must be developed
- Develop strategies to ensure that risks are considered during the design and development of IPAS systems

Preceding the summit, EDUCAUSE convened a webinar for attendees to provide context for the ensuing discussion. The webinar also highlighted several case studies of institutions using various approaches to IPAS system adoption and implementation. This report captures key findings and discussion points drawn from summit participants, with the aim of extending this conversation to a wider audience of higher education leaders.

## IPAS Background

Educational institutions have always had a vested interest in their students' performance and success, but greater emphasis on credential completion—backed by new models for outcome-based funding at the state level and a completion agenda at the national level—has thrust student success into sharper focus. Proposed solutions include data-driven strategies to increase student retention and graduation rates and to enhance students' potential to achieve successful careers.

The Obama administration initiatives announced in August 2013 aimed at making college more affordable include a proposal to promote innovation through the use of technology for student services. These services include e-advising tools that can alert instructors when a student requires additional support and can help students select the courses that will move them toward degree completion as quickly as possible. Some colleges and universities are already well on the way to adopting and implementing IPAS systems that incorporate education planning, progress tracking, and early alerts, among other features. Many more institutions are in the early stages of developing data-informed student success strategies, assessing their advising capabilities, and determining system requirements.

An in-progress EDUCAUSE Center for Analysis and Research (ECAR) study is investigating IPAS capabilities and needs among a cohort of institutions active in student success initiatives.<sup>1</sup> The study focuses primarily on the technology components of IPAS but also explores the organizational and cultural factors behind effective practice, which include the organizational dynamics likely to affect the selection and implementation of systems to support student academic success services.

The institutions in the study's cohort, while mostly positive about their analytics capabilities and their leadership being attuned to using data in decision making, was less certain about the ability of advisors and other student services staff to effectively access and use student data to optimize student success. Many respondents in the study worry that inadequate collaboration between departments and lack of systems or data integration cause IPAS effectiveness to suffer. Still, a large majority of the institutions surveyed plan significant investment in IPAS systems and solutions in the coming years, and virtually all thought their use of technology in this area would increase over the next five years.

Asked about concerns regarding the growing use of IPAS technology, respondents focused far more on driving its use than on potential misuses. While eight in ten respondents saw faculty reluctance to adopt IPAS systems as a major or moderate concern, only 12 percent expressed concern about breaches of privacy rights. These results raise the concern that the enthusiasm for adopting new student success technologies could outpace data-risk awareness and mitigation.

In October 2013, EDUCAUSE hosted a webinar for summit attendees to discuss the cross-section of activity among colleges and universities investing in IPAS and to explore policy drivers for creating these systems. A primary question raised was, "As institutions leverage information systems to collect data to help students succeed, what are the data-related risks to bear in mind?" Conversely, "What opportunities might institutions lose out on if they don't seek to harness student data to optimize student retention and degree completion?"

As institutions contemplate their next student success initiatives, they see opportunities to increase the proportion of students who complete a credential, reduce the time to completion, and reduce the number of excess credit hours a student accrues throughout the college career. Also important is identifying at-risk students, their specific risks, and what steps can keep students on track with their academic plans. In response, institutions are exploring a range of strategies and approaches, including use of predictive analytics and customer relationship management (CRM) systems, as well as rethinking student orientation and first-year experiences to more closely track student actions such as completion of remedial coursework.

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<sup>1</sup> See <http://www.educause.edu/library/resources/integrated-planning-and-advising-services-benchmarking-study>.

## Institutional Case Studies

While not inclusive, the following examples of IPAS implementation shared during the EDUCAUSE webinar provide a useful background for reflecting on key issues and requirements for IPAS adoption.

### Sinclair Community College

In 2002, Sinclair Community College in Dayton, Ohio, began collecting data about student transportation, child care needs, and other nonacademic factors that might affect student success. The aim was to develop individualized academic and “life challenge” plans to inform advisors and other student services personnel about the issues facing specific students. This initiative recognized that the challenges students encounter outside the classroom often derail their academic careers. Sinclair’s open-source [Student Success Plan](#) promotes a case-management approach to student services. Access to personal student data is role based, providing practitioners with the widest view appropriate. Advising focuses on helping develop an action plan that not only details the classes for students to take but also recommends exploring rideshare opportunities or discount bus passes to ensure they can get to class.

### Austin Peay State University

Austin Peay State University in Clarksville, Tennessee, employs predictive analytics to assess the likelihood that a particular student will succeed in a specific major by recommending specific courses for the degree program. Recognizing that when students enroll, they face many choices—which can seem overwhelming—the university focuses on helping students make better choices. Basic data include a student’s test scores (ACT, SAT) and prior academic history in high school, including GPA. That information is integrated into [Degree Compass](#), the institution’s learning analytics system, to provide baseline predictions about overall student success and course performance (the likelihood that a student will earn an A, B, or C in a particular course). This information is available to advisors as they work with students not only to register for courses but also to explore degree options. The university has developed a global architecture of degree programs to identify “fingerprint” courses—those courses within a major that tend to determine a student’s success within a discipline. If Degree Compass predicts that a student will do poorly in these fingerprint courses, the likelihood of success within that major is low. Advisors and students can look at courses needed globally and within a degree and rank the options in terms of those in which a student will have the best chance to succeed.

### Lone Star College System

The Lone Star College System in Texas has embarked on development of an [Education and Career Positioning System](#) to help students connect education, career, and life goals. A personalized education “vault” for students allows them to collect in one place not only transcripts and other education records but also loan and grant information, career data (such

as salary projections and comparisons), and job opportunity information (where the jobs exist). The vault encourages students to think in terms of lifelong learning and the connection between education and work. The idea is to make all this information—which belongs to the students—accessible so that they can review and add to it at any time. This creates an ongoing roadmap of where they are headed as opposed to an isolated snapshot of where they've been. Making this information accessible to students also enables a more informed look at career options and provides opportunities for them to narrow their choices based on personal goals and interests.

## Balancing Benefits and Risks

Despite considerable momentum behind increasing the role of analytics within higher education, a corresponding societal concern has emerged regarding how entities collect, store, transmit, and use personal data. The growing interest in student success initiatives certainly raises this concern. These initiatives use student data to inform interventions—especially among at-risk student populations—and guide students in their course and degree selections. Institutional collection and use of this data put student privacy and data security at risk in ways not always anticipated.

In-depth discussion about the risks inherent in IPAS adoption and solutions for successful IPAS implementation took place during the EDUCAUSE summit. A summary follows.

## Assessing Risk and Seeking Opportunity

Risk—strategic, legal, operational, financial, or reputational—is usually considered in terms of associated downsides, consequences, and dangers, yet risk often provides some level of benefit when managed successfully. Missed opportunities must also be considered a risk—the risk of *not* doing something “risky” that would benefit the institution if it were carefully managed. The key is to evaluate the potential downsides against the benefits before deciding whether to act.

Summit participants were asked to identify risks associated with IPAS, which for this discussion centered on operating several services on the same technological platform: degree planning, coaching/advising, transfer/articulation, and early-alert services. Participants were then asked to categorize these risks and propose solutions. The exchange revealed some of the potential risks associated with implementing IPAS systems and pointed to strategies institutions might employ to mitigate potentially harmful impacts and exploit beneficial opportunities.

One complicating factor is “student swirl.” When students transfer between institutions (which many do), they don't necessarily take data with them, yet most of the summit discussions assumed a stable institutional context. Student success initiatives must address student movement—and thus, data movement—between institutions, which makes interoperability of

systems and data exchanges critical. In fact, the patterns of transfer between and among institutions may itself display important data trends in economic and academic opportunities and provision of important student services, and that data itself could sway interpretations of the data from within an institution.

IPAS is not a simple matter of data collection. Institutional leaders need to understand the nature of the data collected, how it is used, and its definitions and parameters. Because of the many parties involved, stakeholders must learn to work together even when the organizational “home” for these activities is not clear. Finally, while much of the summit conversation centered on tools, leaders can’t simply focus on the development and delivery of IPAS tools. They need to examine the end-to-end student experience, the processes surrounding student advising and degree planning, and the institution’s approach to fostering relationships between students and faculty, student services staff, and others. Ultimately, these relationships serve as important building blocks for students and institutions as they strive to increase student success.

While not a comprehensive compilation, summit participants grouped IPAS concerns and risks into these key areas:

- Strategic opportunities
- Legal and compliance issues
- Unintended consequences of third-party data access/use
- Data alignment and integration
- Support of IPAS systems
- Determinism

The categories overlap, and no single approach fits all circumstances, given the inherent differences among institutions.

### Strategic Opportunities

IPAS system implementation carries a variety of potential rewards; thus, institutions should consider the risk of failing to implement IPAS. Strategic opportunities afforded by a data-driven approach to IPAS include the chance to benefit students, institutions, and society. This can happen in a number of ways.

**Improved instruction and learning.** A data-driven approach to student success can strengthen the connection between research and teaching, increase the agility of an institution in responding to student needs, improve student persistence through targeted intervention, better align IT and organizational strategies (research, analytics, efficiency), increase the portability of

learning outcomes, give students more insight on how they are doing, and improve student retention and graduation rates.

**Improved student outcomes.** This includes improvement in both cognitive and noncognitive factors, such as student motivation.

**Better stewardship of resources.** Better management of student data might accelerate educational progress, and early interventions have the potential to improve student performance in courses and programs. Both can lead to increased retention, which translates to tuition revenue that otherwise might be lost. The resulting improvement in financial returns over the long haul and potential significant cost savings through efficiencies could improve retention and graduation rates by lowering costs to students. Institutions might also allocate more funding to completion initiatives—for instance, facilitating graduation in three years versus four—which benefits students financially.

**Increased efficiency in student advising.** Many IPAS advocates think technology can make advising more efficient through smarter self-service tools. At the same time, better identification of at-risk students and proactive engagement with those students might increase personal advising interactions. Human intervention remains an important component of student success, and IPAS technology can help advisors and students focus on completion. With more efficient advising, institutions can better meet their goals, as funding increasingly depends on completion versus enrollment.

**Effective data governance.** Opinions differ as to whether data is an institutional or an individual asset. While questions of ownership and control of an individual's data remain a central point of discussion and concern, IPAS holds the potential to address them. Implementing effective data governance procedures safeguards the privacy and security of student and institutional data.

Many institutions have lots of data but little information. The challenge is to turn data into a productive resource. Attention previously given to institutional or system benefits must now focus on student-level benefits, oriented to individualized learning and student outcomes.

Higher education also needs to focus on interventions for students at risk, with “risk” interpreted broadly (academic, social, financial). Many students fail to attain a credential because of other life circumstances (family and work obligations, financial challenges, etc.). Institutions thus need wraparound services and holistic case management. Those students at the greatest risk will need coaches, interventions, specific services, and subsequent support services. This creates the need to work across institutional silos, organizing disparate services into comprehensive support.

A focus on improving student outcomes should be viewed as a strategic opportunity (keeping students in your state and ensuring students and parents value the education your institution offers), regardless of institutional type. For instance, two-year colleges with open enrollment will have students with a variety of risk factors, whereas four-year institutions may want to use the same case-management tools to move their students to a higher level of achievement.

The benefits to society and the public good should also be considered. For example, helping students reduce their long-term debt carries positive impacts for the contributions they can make to the economy as consumers.

Going forward, principles to guide IPAS data initiatives include:

- Moving from anecdote to data-supported action (data-driven culture)
- Looking forward (analytics) instead of backward (research)
- Being proactive instead of reactive
- Focusing on individuals instead of cohorts
- Leveraging data to benefit the student and the institution

### *Institutional Solutions*

1. Establish a cross-division retention task force.
2. Bring the IPAS initiative proposal to the board.
3. Identify executive leadership to be responsible and accountable (such as a vice president for student success).
4. Build a culture that values data-driven decision making. In doing so, don't talk about data warehouses to faculty and administrators; instead, create dashboards and tools that give them useful information.
5. Make the invisible visible through data mining; for instance, employ data to identify at-risk students.
6. Act on the return on investment (performance-based funding gets people focused, for instance) and influence student behavior via rewards (such as tuition discounts for students on track to graduate or one-time success payments for completing a program on time or early).
7. Address noncognitive needs of high-risk students before turning to broader academic needs.

## Legal and Compliance Issues

A patchwork quilt of regulatory environments exists in the United States. Unlike the European Union, which has more robust data protection, no comprehensive U.S. privacy or security law exists. Furthermore, many institutions are not collecting—or using—data in a coordinated manner. Institutions should understand what they are doing with data collection and how data collection and storage technologies work.

IPAS-related legal considerations encompass internal and external compliance concerns that fall into several groups:

- Breaches and the results of inadequate protection
- Regulatory compliance (FERPA, HIPAA)
- E-discovery rules
- Student privacy expectations (confidentiality)
- Institutional policy and the vetting process for data collection and access
- Research data/institutional review board (IRB) issues
- Verification of controls (are vendors doing what they should?)

While some students seem ambivalent about data collection and privacy, student privacy expectations are a big concern in higher education, and many students care what personal or academic data is collected and how it is used. The *ECAR Study of Undergraduate Students and Information Technology, 2013* notes:

The nature and degree of undergraduates' expectations of privacy is the subject of some debate. What is beyond doubt is that students are extremely sensitive to the boundaries between their personal and their academic lives. Even when safeguards are promised, students resist the integration into education of technologies that they perceive to be primarily personal, clearly indicating that because some technology is used widely by students does not mean that it should be leveraged for academic use.<sup>2</sup>

How well do institutions disclose details about the information they collect? What is the relationship between privacy, legal issues, and institutional values? What would students willingly give up for their data to be applied usefully? For instance, will IPAS have a “Big Brother” effect, or will students embrace IPAS initiatives? The difference in perception might depend on how clearly institutions communicate their goals to students and how sensitive

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<sup>2</sup> Eden Dahlstrom, J.D. Walker, and Charles Dziuban, with a foreword by Glenda Morgan, *ECAR Study of Undergraduate Students and Information Technology, 2013*, research report (Louisville, CO: EDUCAUSE Center for Analysis and Research, September 2013), 32.

institutions are to student concerns. Institutions should first review their privacy statements if they want to engage in these systems or actively mine student data.

A big data approach requires more informed consent and more prior notice about what data institutions will collect than is standard policy for most institutions today. For instance:

- What happens when we add into these systems all the different types of data collected? Have we considered all the transparency and privacy issues? A related concern is informed consent about all uses of the data, not just the use at point of capture.
- What duty does an institution have to act? What about students in degree programs that have no job prospects, or those enrolled in a class that analytics suggest they will fail? A related concern is unintended ethnic/gender stereotyping through inexpert use of data.
- What happens if we know students are failing and we keep taking their money?
- When we talk about transparency in using data to help students, what does this really mean?
- What happens when records are subpoenaed or requested by companies or activist groups on the basis of sunshine or freedom of information laws? How do we respond to people who want to know the success rates of classes taught by certain professors?
- How can institutions work within systems or consortia that have different interpretations of key compliance requirements? How does the definition of the regulatory environment help, hinder, or facilitate interinstitutional sharing?
- In working with human research subjects, if we aggregate all the data, do we need to involve the IRB for process and oversight?
- What liability does an institution incur when institutional data is stored by outside parties or organizations (such as cloud-based data storage)?

### *Institutional Solutions*

1. Establish clearly defined, role-based access rights; communicate them to stakeholders; and audit them regularly. Data classification can assist this process, such as sensitive/restricted, internal access, or public.
2. Communicate to students why the institution collects data and how it uses the data.
3. Create policies for data retention (what you retain and for how long). No one wants to destroy data, but be clear with students about what you save and what data you destroy when they leave the institution.
4. Allow students to create their own educational records to take with them, distinct from their transcripts.

5. Arrange for external review of your practices concerning data security and data governance.
6. Hire a chief privacy officer. (Note: This recommendation is institution-specific based on culture and risk tolerance; it might not scale for all institutions.)

### Unintended Consequences of Third-Party Data Access and Use

Concerns abound about the misuse of data or its use for anything other than its intended purpose. These unintended uses occur for a variety of reasons, such as when a third party uses data in ways not envisioned by the institution or when a third-party agreement predates the development of new data-analysis techniques. Institutional leaders must also understand and safeguard against unintended consequences of third-party data access or use from the student perspective. In this discussion, a third party may be an external entity (a vendor or service provider), another institution, or possibly even a department within the institution that uses data to which it previously did not have access.

**Data ownership.** Third-party data access and use raises questions about intellectual property ownership. What constitutes an unintended or inappropriate use of data depends in large measure on who owns the data (the institution, the student, or the third party) or thinks they own the data and on what those different parties bring to their evaluation of appropriate access and use. Questions regarding who owns the data include instances when the government or even the institution itself changes the legal framework under which data were originally collected, creating new opportunities for third-party use without safeguards. Institutions should clarify ownership and use of data during contract negotiations, but vendor lock-in—the costs of moving from one vendor platform to another—becomes a real risk. An institution might negotiate adequate safeguards initially only to have them eroded by contract renewals.

**Data misuse.** Data can be misused in unanticipated ways. For instance, while vendor sale of student data is easy to address within the terms of a contract, what happens when the vendor buys a different data set and compares it against the institutional data to generate ancillary benefits for itself? How does an institution prevent that (mis)use? Leaders need to consider what third parties might do with institutional data that the institution might find inappropriate. In some cases, a data-brokerage approach can permit access to data for specifically approved purposes at specifically approved times.

**Data models.** While third-party data services and interinstitutional data transfer offer possible benefits, they come with responsibilities not yet formally or well defined. Creating common data models can enhance benefits and reduce the risks of third-party and interinstitutional data exchange. Sharing the same language and conceptual model underpins data security within and across institutions. If institutions develop a platform that collects data in various forms, they can use the data to inform institutional and student decision making, which requires a degree of openness and data sharing that also allows automation to improve service delivery. Needed as

well are a clearly defined ecosystem with standards regarding which institutions participate and what they make available to each other (and in what form), plus community-defined principles about interinstitutional data transfer and handling at the receiving institution.

**Data decision making.** A key question is whether higher education collectively can address institutional policies and processes for auditing third-party providers on security and privacy issues. In the United States, the general idea is that anything not prohibited is permitted. Think about this in the context of third-party use of student data. Because we do not have a comprehensive legal structure at the national level, institutions improvise. A consortial approach to engaging with the vendor community could help ensure these concerns are addressed effectively. First, leaders must focus on remedies or barriers to potential third-party misuse. Careful contract negotiations can put effective standards in place. Second, leaders must clarify who constitutes the third party. For example, if one institution provides services to another, the tendency may be toward trusting and not treating it the same as a vendor in terms of validating security procedures. This must be overcome, with all third parties held to the same validation standards. Finally, leaders must address the multiple data systems and sources “bolted on” or added to institutional systems and processes. Do we understand the additional risk associated with each new bolt-on? This situation reinforces the importance of having good audit practices and good contracts to govern third-party use. Inasmuch as higher education institutions vary significantly in terms of access to legal counsel and procurement expertise, consortia of higher education attorneys, technologists, and procurement experts should continue to draft model language or sector-wide agreements that can be used by institutions regardless of their budget, size, or access to counsel.

### *Institutional Solutions*

1. Implement technical controls and contract terms.
2. Develop explicit governance practices and policies to support institutional objectives for third-party access and use of student data.
3. Provide transparency, allowing students opportunities to review and correct their data.

### **Data Alignment and Integration**

Together with a better understanding of data use and users come issues related to data management. Do we know what data we have, and do we use data the way we said we would? How should institutions categorize and align student data to ensure its use for the right purposes while addressing institutional needs? Related topics include data governance (responsibility), data quality metrics (measures), and data standards (definitions).

Too often sloppy data management can surface in data initiatives. Pitfalls include overreliance on what can be measured easily, data zealotry (data “grab”), failure to identify objectives for

data collection and use, and drawing conclusions that can't be confirmed. Effective practices to combat data sloppiness include:

- Achieve consistent institutional data definitions and define the minimum viable use of data, as well as what is in and what is out of bounds regarding use of data.
- Focus on quality versus quantity and on the purpose for collecting data. Don't collect data promiscuously or because you can; collect data only as needed for well-defined and well-justified purposes, and be careful not to use data beyond allowable parameters.
- Categorize data in terms of sensitivity and sources to ensure its use for the intended purposes. Ensure data classification practices that control sharing, and extend classification schemes for student success use. Develop role-based authorization, starting with least-privileged access.
- Consider a centralized organization or team that can serve as a locus for establishing and maintaining robust data management practices.
- Bring in data from external sources to round out the whole student life cycle.
- Review student performance in a way comparable to an accounting audit, with similarly rigorous standards ("generally accepted student performance principles") to answer the question, "Are the conclusions we're drawing supported by the data?"

An emerging trend with IPAS is the desire for a platform that allows institutions to assemble the information they want. For data integration, the general consensus among summit participants was that while the engineering issue can be tricky, it does not pose an insurmountable problem. Establishing common data definitions and role-based authorization have a bearing on getting systems to work together. Primary issues related to data integration follow.

**Data interpretation.** With so much data so easy to collect, institutions must exercise caution not to falsely assume causation where only correlation exists.

**Data analysis and human relationships.** Institutions must continue to provide opportunities for human interactions while training relevant administrators and staff to safeguard against misuse or misinterpretation of data. Because human advisors best understand the nuances built into a pathway for success (such as family circumstances and career expectations), real people/advisors make a difference in gathering insights about personal situations.

**Learning success within IPAS.** While IPAS largely focuses on retention and graduation, other elements promote success, and ignoring them carries risk. Where do noncognitive factors come in? What about grit (perseverance and determination)? IPAS processes and systems should address learning success as well. It's important to define success and to communicate to students all the ways they can succeed (especially the fact that failing is part of learning).

**Transactional data.** Unframed information can be dangerous. Are the data we have suitable and complete for IPAS purposes? How do we know the data we have are meaningful? What is the right way to communicate actionable data? Remember that transactional data are not designed for assessment.

### *Institutional Solutions*

1. Hire people who know how to work with data.
2. Promote a campus culture that encourages effective, actionable, and honest use of data and accuracy in the collection and interpretation of data. Don't let IT drive the initiative. Be sure every affected department participates and that technologists do not make academic and policy decisions. Include faculty and students in developing shared values, and develop policy and explicit data governance practices that build trust.
3. Make an institutional commitment to deliver data with context. This commitment requires a combination of quality analytics, predictive modeling, and informed advice. Institutions must accept responsibility to help the end user interpret data and make recommendations for alternatives to achieve success (for example, only 5 percent are likely to succeed in this program but 85 percent are likely to succeed in that program).

### Supporting IPAS Systems

Effectively meeting student support needs requires clearly identifying the nature of the students the institution serves. Support costs might rise, for example, with a demographic of students requiring enhanced support (such as adult or traditional-age learners with inadequate college preparation). The institution might lack the staff to support the increasing demand for services via these new IPAS tools. For example, significant training and resources might be required to appropriately administer the interventions indicated by early-warning systems. Currently, most institutions need more well-trained staff to translate alerts into effective support. Training faculty and advisors on how systems identify at-risk students will help them understand the limits and context of the alerts.

Because many institutions have long-standing but immature advising practices, those implementing IPAS systems will need a stratified response to advising. The trend is toward using self-service for deciding on a semester's coursework, for example, and face-to-face for more personal or meaningful interactions. Education planning drives a move toward "real" rather than transactional advising, but leaders must expect pushback on using technology for tasks previously seen as needing face-to-face support. While IPAS offers the opportunity to offload routine advising to self-service so that personal advising can focus on higher needs, a balance is required; staff resources must include an enhanced, personalized approach to assist

students. Of course, other ways to get the most from limited advising resources include group advising and early advising.

Already noted as IPAS concerns for students are awareness, control, and portability of their data. Other concerns about support of IPAS systems include determining how IPAS initiatives work best for veterans, post-traditional students, adult learners, and persons with disabilities. In short, implementing IPAS systems will redefine institutional relationships, with significant impacts on traditional student services and faculty roles.

### *Institutional Solutions*

1. Frame the way you present IPAS information to students and advisors—that is, elevate advising to make the most of face time with advisors.
2. Ensure appropriate training for all. Bring in experts to train relevant administrators and staff and sustain professional development efforts over time to develop internal expertise. The necessary skill set probably involves case management and coaching more than analytics. Soft skills such as interpersonal communications among advisors will help students understand IPAS data and analyses.
3. Devise IPAS systems that communicate to the entire support staff so that students are connected to solutions, not just notified of problems.
4. Pay attention to wraparound services. To help prepare students to succeed in the classroom, address life issues and refer to community resources as needed.

### **Determinism**

Institutions pursuing IPAS-supported student success initiatives must guard against the use of those systems to predetermine a student's success. Determinism can be understood as a set of environments or rules that predict the outcome for an individual based on patterns of past behavior or outcomes in the aggregate. One danger of IPAS is that institutions could use data to limit rather than empower a student's choices based on predicted performance. Where do institutions draw the line between facilitating success and making recommendations versus making decisions for students? To what extent are we guiding students versus dictating a particular path?

Deterministic risk includes an overemphasis on structured pathways that constrain chances to explore, overreliance on data (to the exclusion of personal context), and misinterpretation of a limited number of data sources (or “old” data) viewed in isolation. Advisors must take care not to communicate an expectation of failure or “squash dreams” based on data suggesting that students should pursue a different career path, for instance. An overreliance on systems rather than relationships can occur if advisors lack the time to spend getting to know students as individuals and to understand their specific needs and goals. Remember, even if a model says

that only 10 percent of students with this makeup will succeed in this program, that means that one out of ten will succeed, and administratively blocking them from trying cuts off both those doomed to fail and those destined to soar.

While IPAS provides opportunities to increase retention, expedite credential completion, and lower the financial debt burden of students by helping direct their educational choices, summit participants suggested that a role for failure remains. Students must retain the freedom to pursue challenges that will test their abilities rather than face institutional processes that stifle exploration and growth and push students toward what is safe or easy. Taking a fifth year to complete a degree should not be viewed as failure, and a C grade may mean something completely different to two different students, depending on their backgrounds and goals. Leaders must recognize that success can be defined in many ways and that different populations of students and different types of institutions have different goals.

### *Institutional Solutions*

1. Strengthen first-year experiences that will help measure student skills and competencies and will help students self-identify educational goals and career desires.
2. Ensure that advisors have the tools and skills needed to appropriately assess data in context and in combination with personal interactions with students.
3. Use a moving window of data to guard against drawing conclusions based on past behavior and performance.
4. Provide the context of data to students, giving them the opportunity to review and respond to their personal data.

### **Overall Mitigation Strategies**

The group reached general agreement that all data collection and use entails some measure of risk. Institutional leaders must strive to understand these inherent risks and manage them as effectively as possible. Suggestions were to:

- Create a cross-functional working group to identify risks and establish data governance.
- Train faculty and staff.
- Enact a robust communication plan.
- Reengineer practices based on regular security assessments.
- Promote clear understanding of regulations.
- Employ technical controls such as data encryption.
- Implement external reviews.

- Buy insurance.
- Create a privacy security officer role to track and mitigate data risks.
- Assign or transfer risk to another organization through outsourcing (negotiation of contracts and agreements).
- Have an official incident response team to react to suspect or actual data breaches.

## IPAS Applied: Scenarios for Engagement

A number of variables related to institutional type influence interpretation of student success. For instance, funding and sources of funding can be major determinants of student success, and the type of student served affects the definition of “student success” at different institutions. While all institutions focus on student success, different categories of institutions will define it in different ways. Summit participants examined the needs and challenges of IPAS for community colleges, private research universities, public four-year institutions, and nontraditional universities, ultimately identifying more commonalities than differences.

## Common Data Sources

Although the particular data sources relevant to institutional IPAS initiatives vary by institutional type, there is significant overlap between the sectors. Summit participants offered a broad view of potential data sources and considerations:

- Enterprise resource planning (ERP) systems, student information systems (SIS, including the course catalog and academic planning, and the degree audit), learning management system (LMS) data, precollegiate transcripts (K–12), and competency profiles from other systems
- Military, job, and life experiences and prior skills assessment
- High school data/admissions file
- Test scores
- E-portfolios
- Libraries and e-reserves
- Activities while online, including academic interactions
- Social networking (content, networks of contacts, time spent online)
- Interactions with student affairs and advisor/counselor services and student mentors (internal/external), including professional and peer mentors
- Participation in extracurricular activities

- Housing records (on/off campus, roommates)
- Survey data of student satisfaction and engagement
- Disciplinary records and law-enforcement data (get counsel involved)
- Student employment status (to review the mix of work schedule and curricula)
- Free Application for Federal Student Aid (FAFSA) and student financial situation
- Student career goals
- Personal “grit” factors such as psychological tendencies or personal experiences that indicate resiliency and likelihood of persistence
- Labor market and census data
- Third-party system data and portable student data

Decisions about what data sources to incorporate must be carefully weighed and periodically reviewed to ensure relevance. For instance, policymakers have shown an increased interest in alumni employment and income measures to inform potential students’ consideration of an institution, as well as current students’ interest in remaining at the institution. Knowing more about nonacademic markers of success such as social data (social network data) and life-experience data would be helpful to advisors. Do students have computers at home? Do they have mentors other than family members? Service learning organized by the institution is not typically tracked in the SIS, for example. If early alerts rely on faculty input only, many students who need help could be overlooked.

As external data sources come into play in IPAS systems, questions emerge about where to draw boundaries. Do we want to include socioeconomic status? How should the system use predictive data from FAFSA, SAT, and so forth? Data on other descriptors of students as individuals—whether they have a family, how far they live from campus, and so forth—highlight the need to identify clear lines on defining and using student success factors while maintaining student privacy. This balance becomes even more difficult in an environment where some parents and policymakers believe it is the institution’s responsibility to intervene in students’ lives in the service of acting in their best interest.

### Core Requirements for IPAS Systems

In the same way that institutions share common needs for data sources, all sectors share core requirements for IPAS system initiatives. These include flexible, customizable, one-stop shopping for advisors and students and a feedback mechanism that lets students not only see information but also do something about it.

In addition to broad buy-in from institutional and external stakeholders (such as state legislatures), the development of IPAS systems requires student input. Providing more opportunities for students to talk about the support they need to succeed will help leaders understand and maximize student experiences and strengths. Institutions need greater flexibility to adapt and personalize online tools for each student, with more configurable services and apps (like commercial apps) and the ability to use data to personalize service (course recommendations and early alerts, for example).

Certain system requirements matter more in some sectors than others. For instance, some institutions would choose strong academic planning capabilities to help students understand academic requirements and make steady, verifiable progress. Some might supplement their efforts with appropriate community resources or training in life skills (child care, transportation, testing anxiety) or tools for matching students' noncognitive needs to resources, since students often fail for nonacademic reasons. Other institutions might want a top-down, standardized degree plan with defined curriculum requirements and clear time-to-degree, cost-to-degree, or credential-attainment projections. To ensure a human interface to help students interpret and act on information appropriately, an institution also might choose early alerts on performance concerns, with the option to connect students to advisors via phone, Skype, chat, and e-mail.

All institutional types benefit from the following system requirements:

- Modern interfaces with anytime, anywhere mobile access for students, faculty, and staff
- Access tailored to specific audiences (student, faculty, and staff)
- Data visualization with just-in-time and drill-down capability
- Integration of all student data (co-curricular)
- Layers of confidentiality (with defined authorization)
- Ease of use
- Analytics and reporting support

Similarly, all institutions might benefit from systems offering advising and coaching services that move from competencies to career via a recommendation engine and transfer and articulation agreements where credits easily move in and out. Ideally, systems should provide flexibility for different business processes and integrate pre- and postenrollment data and nonacademic data to better understand an individual student's context. Other common criteria include system building blocks and extensible capabilities (APIs, web services, etc.), inexpensive ways to add data elements, and platform independence (cloud systems will be needed for students to take their data with them).

Beyond the reliance on specific data sources to shape IPAS initiatives and core requirements for IPAS systems, questions arise regarding institution-specific drivers and concerns. When summit participants were asked to identify—by institution type—their key drivers, risk management concerns, and recommendations for student success systems moving forward, the results showed considerable overlap. Few drivers to adopt IPAS, risks, or recommendations apply only to one institutional type. In the following summary, specific sectors are referenced where appropriate.

### Return on Investment

Higher education increasingly seems pressured to adopt a more vocational perspective of success, with outcome-based state funding models sometimes determining the extent of institutional funding in relation to student success metrics. While private institutions don't face legislative mandates, they are sensitive to the same issues that drive accountability in the public sphere. Moreover, all institutions must be responsive to their boards and show a return on investment (although it need not be strictly monetary) that justifies the expense.

Community colleges have carried out some of the most innovative experiments to improve student success, in part because of their open enrollments and community orientation. Like nontraditional universities—defined as accredited, online, competency-based, degree- or credential-focused institutions—community colleges frequently enroll students at a higher risk for not persisting to credential attainment. Arguably, students of all types of institutions need IPAS to support and sustain their success.

### Drivers

All institutions benefit from opportunities to demonstrate their value through successful employment outcomes for graduates, to minimize student debt, and to maximize revenue through increased student retention (and for some, alumni support). The availability of financial aid, whether institutional, state, federal, or private, is a major concern. Public university drivers also include external pressures such as accountability requirements from the state legislature and maintaining stature relative to peer institutions (through *U.S. News & World Report* rankings, for example). For nontraditional institutions, IPAS offers opportunities to expand career options through more efficient curriculum pathways to a marketable credential.

Other drivers may include:

- The need to increase completion rates and student success rates, especially among the open-access, often underprepared student population at community colleges.
- State policies for student degree plans, a greater focus on matriculation, a shift from course-based to competency-based education, and the shift to more complex advising responsibilities at public universities.

- Cost control for the institution and students, especially if colleges can scale IPAS systems with less labor-intensive approaches to student advising.
- The increased demand for trained workers that compels credential completion in the face of increased competition from other institutions, the workplace, and alternate educational pathways.

Many of these drivers to adopt IPAS feed into a desire to increase competitiveness and marketability, no matter the type of higher education institution.

### Risk Management

Many factors affect determinations of risk and decisions on how best to manage each one:

- Legal and regulatory compliance concerns related to disclosure and liability, technical or contractual impediments, duty of care, brand/reputation, and intellectual property affect all higher education institutions. Each requires clear processes for attainment.
- Any institution offering online programs (especially the nontraditional university) requires system reliability and redundancy in the event of temporary service loss.
- It is essential for all colleges to hear all student voices—women, veterans, low income, first generation, and people of color—as well as employer voices. This is a challenge for community colleges in particular, given their open-enrollment model, and for public institutions facing increased pressure to graduate trained workers and provide competency-based education.
- Analytics have become increasingly important in making decisions about student success initiatives. One question is where to draw the line on student interventions and how much responsibility to accept when initiating them. What happens when data correlated with particular outcomes is—or is not—used to intervene with an at-risk student's academic career path?
- Availability of data (some data are still on paper) and data integrity (manual input calls data integrity into question) can be obstacles. Higher education needs good data classification, good business processes for data collection and entry, and good data governance.
- Data misuse/breach carries huge risks for higher education. Now that we have a great collection of data, how do we keep it away from people who want to misuse it? We need good access control, strong data retention and destruction policies (data life-cycle management), and contractual controls.

- An inability to deliver services and support stakeholders will raise doubts and concern that could damage widespread use of IPAS systems. Does the system do what we think it does or need it to do?
- The “creepiness” factor of holding student data without sufficient protections and clearly specified (beneficial) uses of it is a risk to institutional reputation and public perceptions of our trustworthiness. Without a good opt-in/opt-out process or clearly defined privacy policies, we risk deterring students from coming to our institution.

## Recommendations

For the most part, summit participants’ recommendations for successful adoption of IPAS systems fit all institutional types and many other IT projects and initiatives as well. Together, the collected advice offers a path forward to the successful implementation of IPAS systems.

1. Secure executive sponsorship, prioritize and align the initiative with organizational objectives, and promote ownership of the system by faculty and advisors—“people who do this every day.” This effort can’t be led by IT; it requires full participation from all involved, and data must be made available to others as needed or requested. Form internal and external partnerships; remember, a coalition can help distribute expenses.
2. Look for national standards on where institutions use data, under what circumstances, and for what purposes. Look for data norms in planning, developing, and deploying IPAS systems. Find a balance/fit between institutional and system/district needs in IPAS system design and implementation. Look outside higher education for different approaches to solving IPAS-related problems.
3. Clearly define the system’s goals and objectives, secure the right skill sets (data scientists, analytics experts, and developers—and internal legal counsel), define the data and build a strong data governance program, and think about the data life cycle. Will this system look at historical trends, or does the data “go away” when a student graduates? Requirements for student completion versus student retention may differ, for example. Continually assess and build in analytics about the system itself. Finally, be aware of overlap between data in the traditional SIS and new IPAS systems.
4. Get buy-in from multiple levels and seek input from numerous constituencies. Start with this question: What are you trying to solve? Broaden the conversation across the campus to generate broad buy-in and understanding of what IPAS can and can’t (or should and shouldn’t) do. Don’t assume that institutional staff and stakeholders understand what’s currently possible or the potential implications of different sources/uses of data.

5. Ensure that policies involve operational staff. Make sure functional and technical staff work together to support exploration of these issues and evaluate them effectively. Ensure appropriate transparency and preparation to provide notice and disclosure as needed.
6. Develop a digital rights management policy to categorize data and risk rank (confidential, proprietary, general/public).
7. Standardize data definitions and interoperability. Start with data you already have that is well understood and broadly available across the higher education community. Don't collect and maintain data that you're not prepared to use.
8. Don't try to do everything at once. Break implementation into phases—retention, progression, and completion—and use an agile development methodology that allows for improvement and iteration. Recognize this phased approach as part of a maturation process.
9. Make sure users have enough time to explore and understand the relevant data available to them using IPAS. Train advisors, instructors, and other data users to ensure they don't use data to profile or marginalize students. Make the end-user experience fun (perhaps “gamify” student experience with your system).

## Conclusion

Many drivers impel colleges and universities to seek new ways to help students succeed and move more swiftly to degree and credential completion. In pursuing IPAS-related tools and systems for this purpose, higher education must concentrate on better integration of existing data sources and collection and integration of new types of data.

Regardless of approach, colleges and universities must be clear about why they collect specific data and who has access to it. To foster trust among students and other stakeholders, institutions must also mitigate the potential for overreach and misuse or misinterpretation of data. They need good data from enough sources to ensure that statistically relevant information shapes student success efforts and responses.

IPAS is not a simple matter of data collection. Institutional leaders need to understand the nature of the data collected and how it is used, as well as its definitions and parameters. Leaders can't simply focus on the development and delivery of IPAS tools; they need to reexamine their administrative and academic processes and institutional support to foster relationships between students and faculty, student services personnel, and so forth. Ultimately, these relationships serve as important building blocks in increasing student success.

As institutions develop and implement IPAS initiatives, the collection, storage, and use of data introduce new risks and opportunities. While the solutions chosen will vary according to the size and type of institution, student “swirl” in particular requires data portability and

interoperability. Higher education student success initiatives must address student movement—and thus data movement—between institutions. A possible solution is to store information in the cloud for easier access by all stakeholders, beginning with students and advisors. This assumes adequate security and privacy safeguards, including appropriate access.

Institutions also must guard against the use of IPAS systems to predetermine a student's success. We must instead use data to empower a student's choices. Where do we draw the line between facilitating success and making recommendations versus making decisions for students? To what extent do we guide students versus dictating a particular path?

Implementing IPAS systems will redefine institutional relationships, with significant impacts on traditional student services and faculty roles. We need to plan, develop, and implement IPAS systems to support institutional goals and ultimately student success.

We already know how to begin tackling many of the challenges facing higher education today. IPAS systems can help us address problems facing our students by informing student success initiatives with data collected for that purpose. To address concerns about privacy and security raised by IPAS deployment, we can apply or modify solutions and ideas already developed for similar data-collection initiatives. IPAS holds promise for increasing student retention and degree completion—a goal many higher education institutions urgently seek—and merits close consideration. The recommendations provided by the summit participants offer a clear path to begin the journey.