EDUCAUSE CENTER FOR ANALYSIS AND RESEARCH

2017 Trends and Technologies: iPASS

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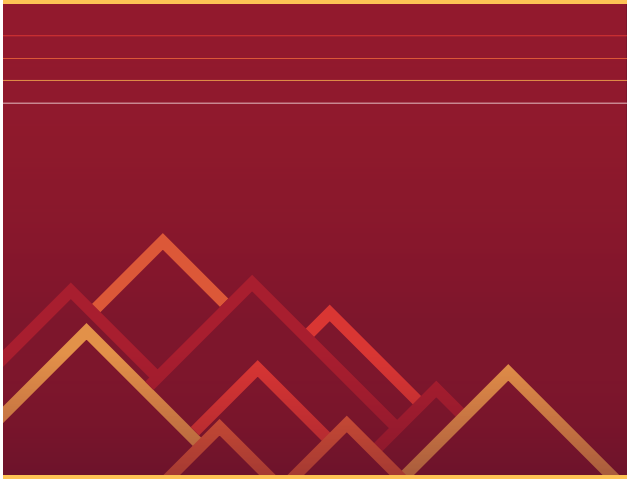

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EDUCAUSE is a nonprofit association and the foremost community of IT leaders and professionals committed to advancing higher education. EDUCAUSE programs and services are focused on analysis, advocacy, community building, professional development, and knowledge creation because IT plays a transformative role in higher education. EDUCAUSE supports those who lead, manage, and use information technology through a comprehensive range of resources and activities. For more information, visit educause.edu.

Introduction

Since 2014, EDUCAUSE has examined higher education's top strategic technology priorities. This year, in addition to reviewing the overall list of strategic technologies, EDUCAUSE will publish nine separate reports examining in detail the technology domains we asked about and reviewing each domain's component technologies and the trends associated with those technologies. This report covers the 13 technologies and 11 trends included in the Integrated Planning for Advising and Student Success domain.

For the first time, in 2017 student success rose to be among the top 10 issues in the annual EDUCAUSE survey of strategic technologies. Urgency has grown at both national and state levels to address the inadequate numbers of students finishing what they start, too often leaving without credentials. Solutions intended to solve the problem have proliferated as technologies have matured and big data is more readily collected and used in support of new approaches to helping students succeed.

The focus of this report is the trends and strategic technologies associated with Integrated Planning and Advising for Student Success (iPASS). Mature, commonly deployed technologies (such as financial information systems or networks) may be among the most mission-critical technologies, but they are generally more likely to receive operational rather than strategic attention.[1] Strategic technologies, by contrast, are the relatively new technologies institutions will be spending the most time implementing, planning for, and tracking in 2017. None of the 13 iPASS technologies analyzed in this research is currently in place in more than 30% of institutions.

Technologies are what IT organizations do. Trends, on the other hand, are widespread external factors that influence institutional and IT strategy and often spur the adoption of technologies. This report examines the trends that institutions are paying the most attention to and that are influencing emerging institutional IT strategy the most. This year's trend list included 11 items closely associated with iPASS.

Covered in This Report

Trends

- Blending of roles and blurring of boundaries between IT and academic/administrative areas
- Business process redesign
- Changing faculty roles (focus on advising and student success, growth in adjuncts, etc.)
- Changing vendor-institution relationships (bypassing IT to work directly with business-area leaders)
- Changing vendor-institution relationships (moving from a transactional to a strategic relationship)
- Concerns about institutional sustainability or even survival
- Data-driven decision making
- Diversity and inclusivity
- Institution-wide data management and integrations
- IT as an agent of institutional transformation and innovation
- Student success focus/imperatives

Technologies

- Flexible interactive platforms for descriptive and predictive analytics of institutional data
- iPASS (Integrated Planning and Advising for Student Success) technologies
- Mobile app development
- Mobile apps for institutional BI/analytics
- Predictive analytics for learning
- Predictive learning analytics (course level)
- Technologies for degree auditing (documenting and tracking students' educational plans)
- Technologies for improving the analysis of student data*
- Technologies for integrating student records data across case management systems
- Technologies for offering self-service resources that reduce advisor workloads*
- Technologies for planning and mapping students' educational plans*
- Technologies for triggering interventions based on student behavior or faculty input*
- Uses of APIs*

**Part of the overall 2017 Top 10 Strategic Technologies*

Findings and Recommendations

What do we know about the kind of progress higher education might make with iPASS technologies? What trends might influence this progress? While our data can never be a substitute for an institution's own iPASS strategic plan or roadmap, this report can inform an institution's overall IT strategy and iPASS technology-deployment strategy.

The Trends

We characterized a trend as "influential" if it was already incorporated into IT strategy or exerting a major influence over emerging IT strategy. We used that characterization to classify the trends into four levels of influence, based on the prevalence of influence across institutions:

- **Most influential:** Trends that are influential in 61% or more of institutions
- **Taking hold:** Influential in 41–60% of institutions
- **Worth understanding:** Influential in 21–40% of institutions
- **Limited impact:** Influential in 20% or less of institutions

Understand how the most influential trends are affecting your institution. Two trends (listed below from higher to lower level of influence) are influential at 61% or more of colleges and universities:

- *Student success focus/imperatives.* With an increased national focus on student completion, higher education faces a new urgency not only to innovate but also to collaborate across departmental silos to bring about institutional transformation. In an environment of "big data," institutions are being called on to change the way they address student success, resulting in more students finishing what they start and developing the skills to contribute to society in and beyond the workplace.
- *Data-driven decision making.* Data-driven decision making is often used as a synonym for analytics. The term emphasizes the purpose, rather than the process and technologies, of analytics. Many analytics initiatives focus on data, tools, and reports. All are necessary inputs into the activity that makes analytics worthwhile: deriving meaning from the data and determining the best actions to take. Data-driven decision making can take many forms. It can be incorporated into existing planning and management activities and processes. It can also be programmed into applications to generate real-time, personalized triggers, alerts, and advice for students, faculty, advisors, and other constituents.

Review the trends that are taking hold and address them at your institution.

Four trends (listed below from highest to lowest level of influence) are influential at 41–60% of institutions:

- *IT as an agent of institutional transformation and innovation.* Almost all projects involving innovation and transformation strategic in scope involve IT. IT has always had a dual role with respect to transformation and innovation: IT can be the vehicle by which an innovation is realized, and new breakthroughs in IT can open the door for a new set of innovations and opportunities that were scarcely imaginable before. There is no indication that IT will relinquish this dual role; indeed, if anything, the pace of such change only seems to be accelerating. Finally, the power of IT can greatly increase the scope and scale of current initiatives (e.g., the collection and analysis of greater amounts of data provide the basis for new directions for business modeling and technology-enabled student advising).
- *Institution-wide data management and integrations*. Next-generation enterprise IT provides agility, scalability, and cost-effectiveness through a growing combination of applications, architectures, and sourcing strategies. However, it also complicates the challenge of making all those disparate systems communicate with each other. To provide useful information from so many different systems and applications, IT needs an institution-wide strategy for data management that takes multiple stakeholder needs into account, as well as an intentional focus on data integration across many different types of systems.
- *Business process redesign*. Examining and redesigning work processes through business process management can uncover opportunities for greater efficiency, possibly allowing for cost savings or reallocation of resources. For example, business process improvement can decrease the need for customization of enterprise systems and increase alignment between business processes and institutional mission. Because processes tend to span functional unit boundaries, strategies are most successful when they include multiple units at an institution. Business process is more than simply workflow; it encompasses workflow design, systems capabilities, motivation, human resources, policies, rules, funding, and other resources. All should be considered in a business process redesign strategy.
- *Diversity and inclusivity.* Diversity and inclusivity are the lifeblood of higher education. Science and scholarship can only proceed on the basis of encouraging a diversity of opinions and insights proffered by myriad sources. Technology is a key enabler of this dimension, making it possible

to draw on diverse information resources and allowing all voices to be heard. In the domain of teaching and learning, the issue of accessibility—one dimension of diversity/inclusivity—jumped from 7th to 4th in the ELI key issues survey. Both the Department of Justice and the Department of Education have become increasingly active in this area as well. For the IT organization, diversity/inclusivity issues are highly relevant to the issue of sustainable staffing as well as to IT workforce issues.

Understand these trends, and consider their possible role at your institution.

The influence of five trends is limited to 21–40% of institutions. Higher education is monitoring these trends with respect to emerging IT strategy and the deployment of iPASS strategic technologies (listed below from highest to lowest level of influence):

- *Blending of roles and blurring of boundaries between IT and academic/administrative areas.* This trend is in evidence across all dimensions that involve the application of IT. Discussions around the issue of next-generation enterprise IT have suggested new, more integrative roles and skills for the CIO and the IT organization, such as the ability to network "throughout the institution and the higher education ecosystem" and to "integrate a myriad of 'micro best-of-breed' solutions…in very tailored ways." In parallel to this, on the teaching and learning side, almost all strategic discussions around academic transformation take as a starting point the need to integrate a variety of campus organizations to further the teaching and learning mission. Entailed in this blending and blurring of roles are new job titles, new governance models, new skill sets, and new demands for professional development.
- *Changing vendor-institution relationships (moving from a transactional to a strategic relationship).* Next-generation enterprise IT is characterized by a shift in IT's role from being a technology provider to a service broker and partner. This shift allows for a different level of conversation between institution and vendor because IT can broker a strategic conversation between the two, bringing technology investments into closer alignment with institutional mission in the process. In the broker role, IT can ensure that conversations about information security and privacy take place.
- *Concerns about institutional sustainability or even survival.* Higher education institutions are besieged by a host of external problems that include competition from for-profit institutions, alternative educational models, decreased revenue from tuition dollars, and, in the case of public institutions, decreased state budget allocations. Combined with internal

demands to provide the best educational experiences possible for their students, these pressures may undermine the long-term stability of colleges and universities.

- *Changing faculty roles (focus on advising and student success, growth in adjuncts, etc.).* Prompted by sociological, technological, and economic forces, the role of the faculty member in higher education has significantly transformed over the past 20 years. New instructional models and the innovative use of technology have resulted in faculty serving as coaches, software developers, advisors, and instructional leads to sizable cohorts of adjunct faculty. Team-developed courses and demands for increased access to education that can be delivered in various ways have led to an increased focus on the quality of instruction and the rise of the instructional design profession. In his paper on the unbundling of the faculty role, Vernon Smith points to the disaggregation of faculty work to include teaching, course design, assessment, and advising.[2] The faculty transformation continues as an evolving competitive workplace and rising higher education costs place new demands on the relevance of higher education.
- *Changing vendor-institution relationships (bypassing IT to work directly with business-area leaders).* As cloud-based services become increasingly common, individual departments often negotiate directly with vendors and bypass IT departments to select and purchase technology-related services. This practice makes it difficult for IT staff to maintain standards for architecture and integration, and it complicates concerns for information security, compliance, privacy, data management, and data governance. IT departments are responding in part by developing expertise in relationship-management skills, allowing them to communicate better with both campus stakeholders and the vendor community.

The Technologies

The list of strategic technologies included in our survey was derived from the 2016 list and from several authoritative sources that annually identify emerging and maturing technologies in higher education.[3] A total of 13 of the technologies in the survey pertain to iPASS. For each of those technologies, respondents selected one of six response options to indicate the level of activity for that technology at their institution in 2017:

- **Institution-wide deployment:** Full production-quality technical capability is in place, including ongoing maintenance, funding, etc., with deployment potentially supporting institution-wide access.

- **Expanding deployment:** In 2017, we will move from initial or partial to broader or even institution-wide deployment.
- **Planning, piloting, initial deployment:** This technology is not yet available to users; however, meaningful planning for deployment is either in development or in place. Staff are investing significant time (multiple person-weeks of effort) and resources in executing the plan to pilot or deploy this technology within a defined time frame.
- **Tracking:** Multiple person-days of effort will be assigned but restricted to monitoring and understanding this technology (much more than just reading articles).
- **No deployment:** None of this technology is in place, and no work will be under way or resources committed for this technology in 2017.
- **Don't know:** I don't know what this technology is.

We assigned attention scores to the responses, and the scores were weighted to highlight responses indicative of higher levels of activity (expanding deployment; planning, piloting, initial deployment; and tracking) over responses that suggest little or no activity of that kind (institution-wide deployment, no deployment, and don't know).

Understanding what peer institutions (both current and aspirational) are doing can help you gauge whether your institution's current approach is on track or might warrant reconsideration. Some technologies are more relevant for some types of institutions than others. We looked at broad demographic categories, including Carnegie class, institutional size, and approach to technology adoption and found differences in attention score based on those factors. In figure 1, the U.S. mean is the average attention score for an item from all U.S. respondents. The minimums and maximums are the lowest and highest average attention scores among all groups within the categories of Carnegie class, institution size, and timing of technology adoption, with labels indicating which group or groups returned that score. In the event of a tie, all tied groups are represented.

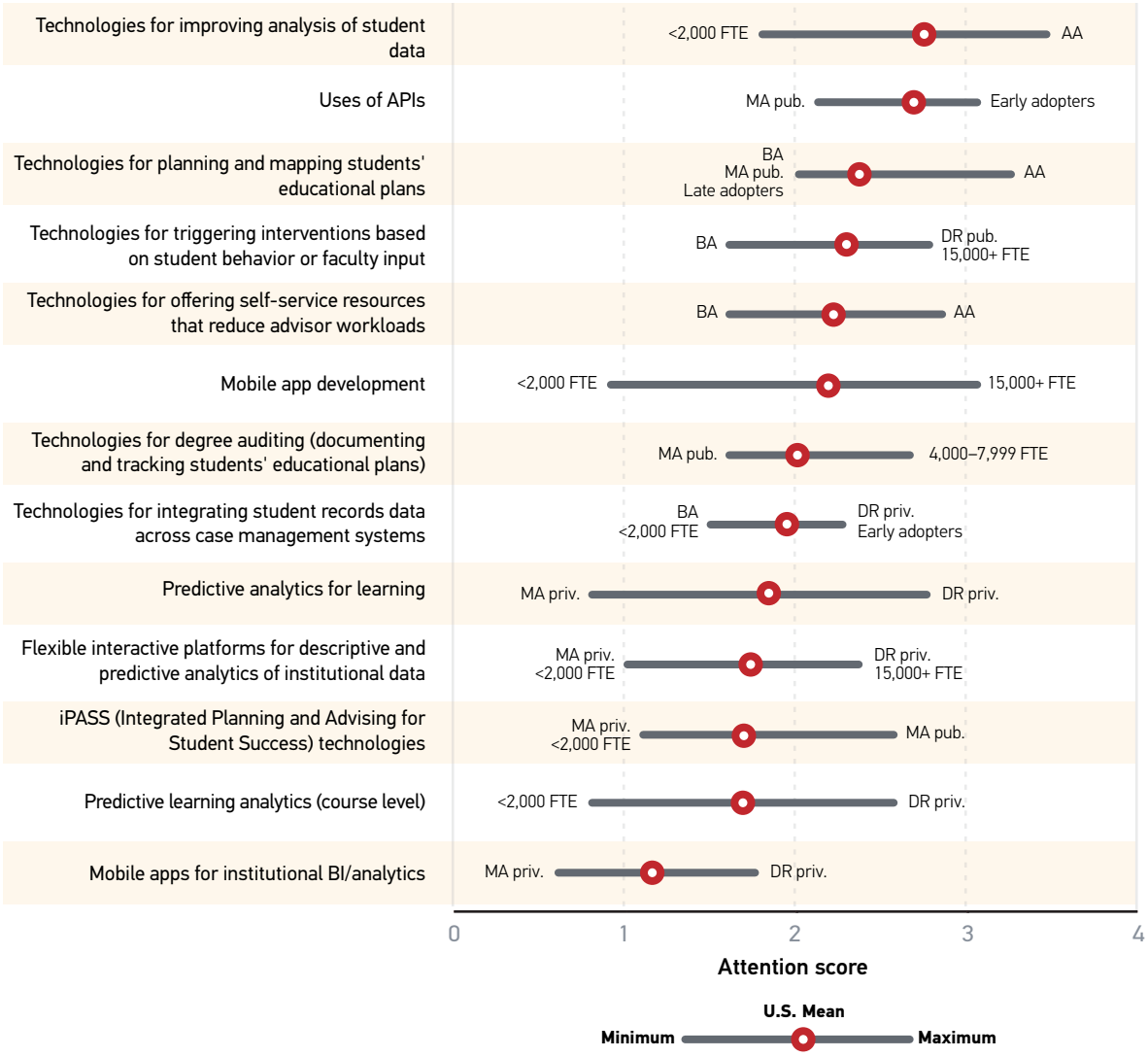

Figure 1. Attention score averages and differences

Looking beyond attention scores, we sought to understand the kind of effort that the largest proportion of institutions is devoting to each technology. We created four attention categories by combining adjacent responses:

- Expanding deployment and institution-wide deployment, combined as **deploy and maintain**
- Planning, piloting, initial deployment and expanding deployment, combined as **pilot and deploy**

- Tracking and planning, piloting, initial deployment, combined as **decide and plan**
- No deployment and tracking, combined as **track and learn**

Although nearly every technology was represented to some degree in each attention category, we assigned each technology to the attention category with the greatest amount of institutional activity for that technology in 2017.

Complete initial deployment and maintain these technologies.

Our research shows that institutions are planning to **deploy and maintain** one iPASS strategic technology:

- *Technologies for integrating student records data across case management systems.* These technologies bring together data—which may exist in multiple systems—relating to each specific student. They make the data available to any staff or faculty member approved to access the information, allowing them to see all the data in the student record that is appropriate for their use. This access gives those responsible for student support up-to-the-minute information and enables them to collaborate to ensure student success.

Pilot and start deploying these technologies.

At this time, institutions are planning to **pilot and deploy** these iPASS strategic technologies (listed below from highest to lowest attention):

- *Uses of APIs.* An application programming interface (API) defines how a system interacts with other systems and how data can be shared and manipulated across programs. A good set of APIs are like building blocks that allow developers to more easily use data and technologies from various programs. APIs are used in many ways in higher education, for example, to pull data from the student information system into the learning management system, to integrate cloud-based with on-premises services, as an approach to security, and to access web-based resources.
- *Technologies for planning and mapping students' educational plans.* Educational planning tools allow students and advisors to work together to build customized pathways through the curriculum that are appropriate for each individual's interests and goals. In addition, these technologies offer a reliable way to chart and track progress toward a degree or credential completion. They also support institutions in the development of schedules that match demand.
- *Technologies for triggering interventions based on student behavior or faculty input.* These applications gather data points from a variety of institutional and academic systems, sending communications to students, faculty,

advisors, and administrators in support of early intervention. They also provide a holistic view of a student's progress, allowing the provision of targeted assistance in support of individual needs.

- *Mobile app development.* Mobile app development (responsive design, hybrid, etc.) is the organizational capability for the development of mobile applications. Organizations must make decisions about native apps for specific devices and mobile web development strategies. Issues of accessibility, security, data protection, and responsive web design also must be addressed when considering mobile app development.
- *Technologies for degree auditing (documenting and tracking students' educational plans).* An application used for degree auditing facilitates analysis of the academic program, comparing the requirements that must be met with what the student has completed and thus guiding the student to the requirements remaining to be met in order to complete a credential.

Decide when these technologies fit your strategy, and start planning. Institutions are carefully watching two iPASS strategic technologies (listed below from higher to lower attention), **deciding and planning** for potential future deployment:

- *Technologies for improving analysis of student data.* These technologies enable immediate access to and rapid analysis of large, complex data sets, making it possible to discern trends in students' engagement with college, in the types of difficulties students are encountering, and in their likely success in attaining credentials across the student body. These technologies allow advisors, student services staff, and administrators to examine broader patterns across departments, divisions, schools, demographics, financial aid status, or other categorizations of interest and adjust strategies accordingly.
- *Technologies for offering self-service resources that reduce advisor workloads.* These platforms make tools such as registration online, scheduling, and academic planning available directly to students, enabling those with professional responsibilities for guiding them to reserve in-person appointments for higher-level interactions and counseling on individual issues.

Learn about and track these technologies.

Institutions are **tracking and learning** about the following iPASS strategic technologies (listed below from highest to lowest attention):

- *Predictive analytics for learning.* Predictive learning analytics is "the statistical analysis of historical and current data derived from learners and the learning process to create models that allow for predictions that improve the learning environment within which it occurs."[4]
- *Flexible interactive platforms for descriptive and predictive analytics of institutional data.* Flexible interactive analytics platforms reflect a shift away from IT-centric analytics solutions to ones that do not require advanced technical or data-science skills. These platforms allow a wider range of users to perform interactive analysis of institutional data. In implementing these solutions, it is important to consider data governance implications because end users have more direct access to institutional data.
- *iPASS (Integrated Planning and Advising for Student Success) technologies.* At its core, iPASS, or technology-enabled advising, uses technology to support broader reforms within the advising and student support function of higher education institutions. Ideally, iPASS uses technology to promote, support, and sustain long-term holistic advising relationships. Using technology enables personnel throughout the institution to engage in advising and student support relationships that approach student support as a teaching function; touch students on a regular basis; and connect them to the information and services they need when they need them, in order to keep students on track to completion.
- *Predictive learning analytics (course level).* Predictive learning analytics is the educational application of analytics by gathering and analyzing details of student interactions in online learning activities. At the course level, the information gleaned can then be used to adjust class activities and coursework to address areas where students may need more or less help.
- *Mobile apps for institutional BI/analytics.* These mobile apps allow the user to access institutional BI and analytics resources and technologies via handheld devices.

Preparing for the Future

Understanding the technologies that are most relevant for your institution and how fast a certain strategic technology may be growing is critical to institutional IT strategy. We estimated the pace of growth based on the percentage of institutions we predict will implement each technology over the next five years (by 2022). Figure 2 positions each technology in one of 12 cells based on institutional intentions (the "recommendation for today") and the expected pace of growth of that technology. Reflecting what was noted above, the figure shows that most of the technologies we tracked are still being explored—rather than deployed—by most institutions.

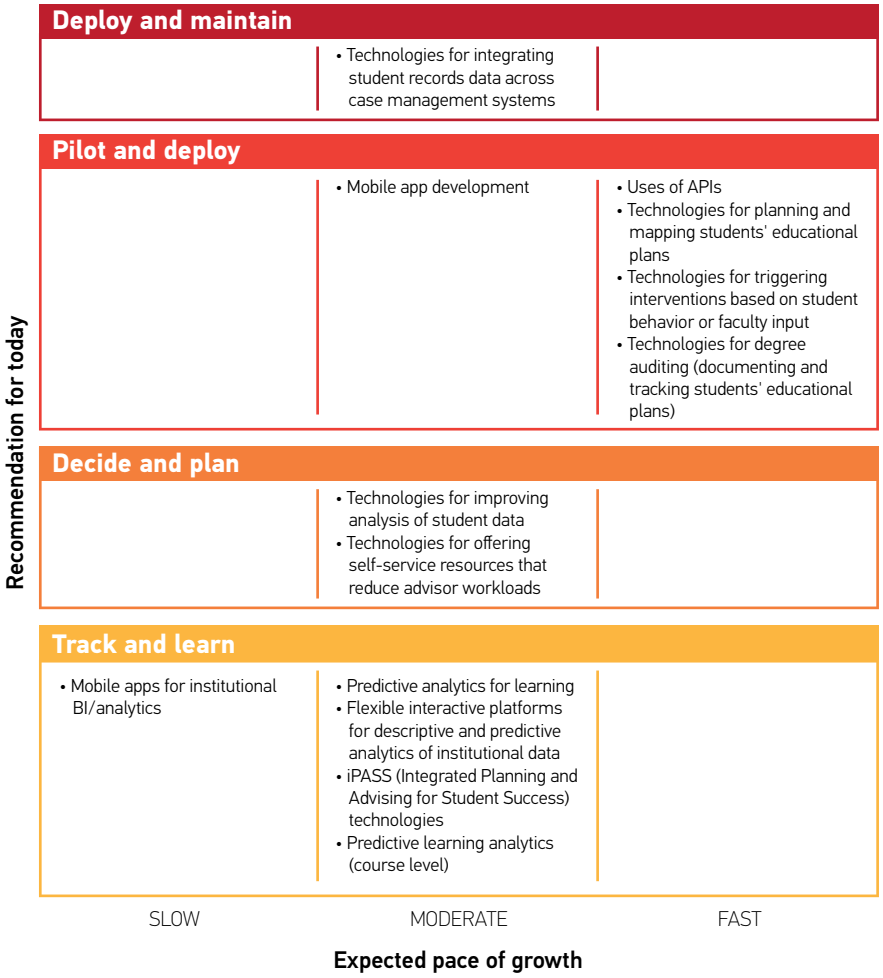

Figure 2. Plans for 2017 and pace of growth for iPASS strategic technologies

Conclusion

Recent research shows that an increasing number of jobs require a postsecondary credential/degree and that having a degree will have a substantial financial impact on your lifelong earnings. Therefore, attention to degree or credential completion will continue to be a top priority for colleges and universities. The complexity of new and evolving technologies in support of student success and the transformation of advising will necessitate new cross-institutional relationships, process redesign, data sharing, and the integration of systems. The result will be an increased emphasis on IT's role as a strategic contributor in this area.

The growth of self-service solutions to address student success and the emergent power of leveraging growing amounts of data make it possible to provide students, faculty, and administrators with new tools that will transform the way they do their work. Given the way in which emerging technologies underlie efforts in all these areas, IT must be at the core of managing this complex transformation. IT leaders should play a central role in integrating these developments across the college or university and will need to pay close attention to innovation in this area, keeping the perspectives and needs of students as primary considerations.

Notes

1. EDUCAUSE tracks these types of established technologies in the Core Data Service because they are widespread enough to enable institution-level benchmarking.

2. See Vernon Smith, "The Unbundling and Rebundling of the Faculty Role in E-Learning Community College Courses," dissertation, The University of Arizona, 2008.

3. Primary sources were The Horizon Report, Gartner's Top 10 Strategic Technology Trends for 2014, and multiple 2014 Gartner Hype Cycles (education, big data, cloud computing, cloud security, enterprise architecture, enterprise information management, GRC, identity and access management, IT operations management, privacy, business intelligence and analytics, and emerging technologies). We augmented those with several additional technologies, most notably in analytics.

4. ECAR-ANALYTICS Working Group, *The Predictive Learning Analytics Revolution: Leveraging Learning Data for Student Success*, ECAR working group paper (Louisville, CO: ECAR, October 7, 2015).