Helio CAMPUS

Better Data. Brilliant Insights.

Data in Focus:

A Clearer Path to Progress Through Institutional Analytics

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Introduction

Analytics use is on the rise in higher education. Nearly 50 percent of institutions consider institutional analytics a "major institutional priority," and another 25 percent say it's a "major priority for some departments, but not the entire institution," according to a recent EDUCAUSE ECAR Report . As Bridget Burns, Executive Director, University Innovation Alliance, wrote in an article for Forbes, the sector may be at a "jumping-off point for policies and practices that define higher education in the digital era." But as the full promise of analytics is on the horizon, institutions often end up with an obstructed view because they are not looking at the full data spectrum. To make meaningful progress towards their goals, colleges and universities need to bring data into focus by taking a broader view.

To get there, institutions need visibility into the connections between enrollment, student success, and institutional financial data. Without it, there is too much information left in the periphery, allowing institutional blind spots to persist.

The Cost of Institutional Blind Spots

When considering the top concerns of college and university presidents are complex challenges such as student success initiatives, controlling costs, and raising non-tuition revenue, it is easy to understand why colleges and universities are eager to use analytics to implement solutions. But those challenges can only be addressed if all relevant information is considered. The cost of ignoring potential institutional data blind spots is that policies, practices, and processes are put in place with good intentions but, due to lack of information, end up magnifying the problem, instead of diminishing it.

Today, this can be seen in institutions pushing efforts that focus on access without putting in place support mechanisms; students will need to be successful once they've enrolled. Or, making investments in high-end dining, recreational, and residential facilities to recruit students instead of considering modifications to need-based financial aid or investments in targeted support initiatives and interventions for at-risk students.

Another example is when an institution has a narrow focus on meeting an enrollment target without a broader view of their students' likelihood to persist or transfer out. Using analytics to ask questions focused on specific stages of the student lifecycle can certainly identify trends and patterns, but those answers often miss key sources of institutional data to provide a full view of risks and opportunities. The example shows how connecting different parts of campus can bring data into focus and leads institutions to more valuable questions and conclusions. As illustrated below, by connecting information across all stages of the student lifecycle, colleges and universities will have a clearer view of their potential for progress or risks.

Putting Your Data In Focus

Narrow Focus
Institutional blind spots persist

Broad Focus
Cross-institutional view

Many institutions fall into the habit of asking questions that they think they already have the answers to. But they don't really know what data they may have because of organizational and technological silos. This results in limited questions at the outset and ultimately the wrong answers. By skipping steps, an institution will get to a point where they're getting an answer that's incorrect and there's been a misallocation of resources.

-James Wiley, Principal Analyst, Eduventures

By shifting analysis and decision making from the narrow lens of traditional organizational and technological silos to a broader view across the student lifecycle, institutions will be better informed to make critical decisions about processes and policies that support outcomes, efficiencies, and decision making.

So, why are higher education institutions challenged with making the best use of their data? They lack the time, talent, and technology to effectively leverage their data for high value analysis that leads to action. Without broad visibility across the lifecycle or the technology and expertise to provide guidance on how to take action, institutions are making assumptions – and decisions – without having the full picture of current conditions, patterns, and trends.

"Critical to focusing any institutional analytics effort is connecting the dots. Linking admissions, enrollment, student success, and financial data adds tremendous value, and is a prerequisite for institutional leaders to ask and answer questions critical for the institution's short- and long-term sustainability and health."

-Darren Catalano, CEO, HelioCampus

Institutional Analytics: Introduction to 4 Data Best Practices

To bring data into focus and ensure they are on the path to the most informed decisions, institutions need to put four interconnected practices in place, which will be covered in more detail later in this paper:

Centralize

Prioritize data collection, quality, and transparency around key questions the institution is facing

Optimize

Focus on building data models and a framework for efficiently and effectively analyzing data across the institution to define and answer those key questions

Visualize

Invest in data analysis and storytelling expertise to communicate and highlight needs across institutional leaders

Connect

Implement "educational intelligence" to address institution-wide challenges and connect analytical insights to the most pressing problems

But at its worst, working in the dark with analytics can feed or create dangerous assumptions about student preferences, performance, and behavior.

Ignoring these four practices can handcuff an institution's ability to make decisions and get an accurate assessment about their most critical issues. Absent these practices, it is impossible to see the story behind pressing topics such as program sustainability, enrollment forecasting, financial aid strategy, and student success. In many cases, root causes can only be determined through identifying relationships and connections among the many sources of data across a campus. Skipping one or all of these steps is happening too often in higher education. Eager to make "data-informed decisions," colleges and universities rush into analytics, often working with too narrow of a view. The result is often enacting ineffective solutions to address the need, yielding poor results. At its most benign, this approach means small missteps or ineffective resource allocation. But at its worst, working in the dark with analytics can feed or create dangerous assumptions about student preferences, performance, and behavior.

This white paper is a guide to finding greater clarity with institutional performance analytics, which is no small task. Bringing data into focus takes an investment of time, talent, and money. By exploring the challenges colleges and universities face in effectively using analytics and offering recommendations through the four steps above, this guide will accelerate an institution's path to progress and help them see a high return on those investments.

Using institutional analytics to make better decisions and improve institutional health is no longer simply a worthwhile endeavor. It has become a pre-requisite to ensuring long-term sustainability. But that does not mean it is an easy one. **Many in higher education operate under the pretense that effectively using analytics is quick, easy, and cheap. It's not.** Compiling, analyzing, and using data from across the student lifecycle requires hard work. In part, this is because of obstacles in higher education that come from its history, structure, policies, and lack of resources. But, an upfront investment to overcome the major types of barriers can take colleges and universities one step closer to tapping the full power of analytics – and it's an investment few institutions can afford not to make.

There is no easy button.

3 Barriers to Using Data Effectively

1. **Data Silos**
2. **No Commitment of Technology, Talent, and Time**
3. **Data Immature Culture**

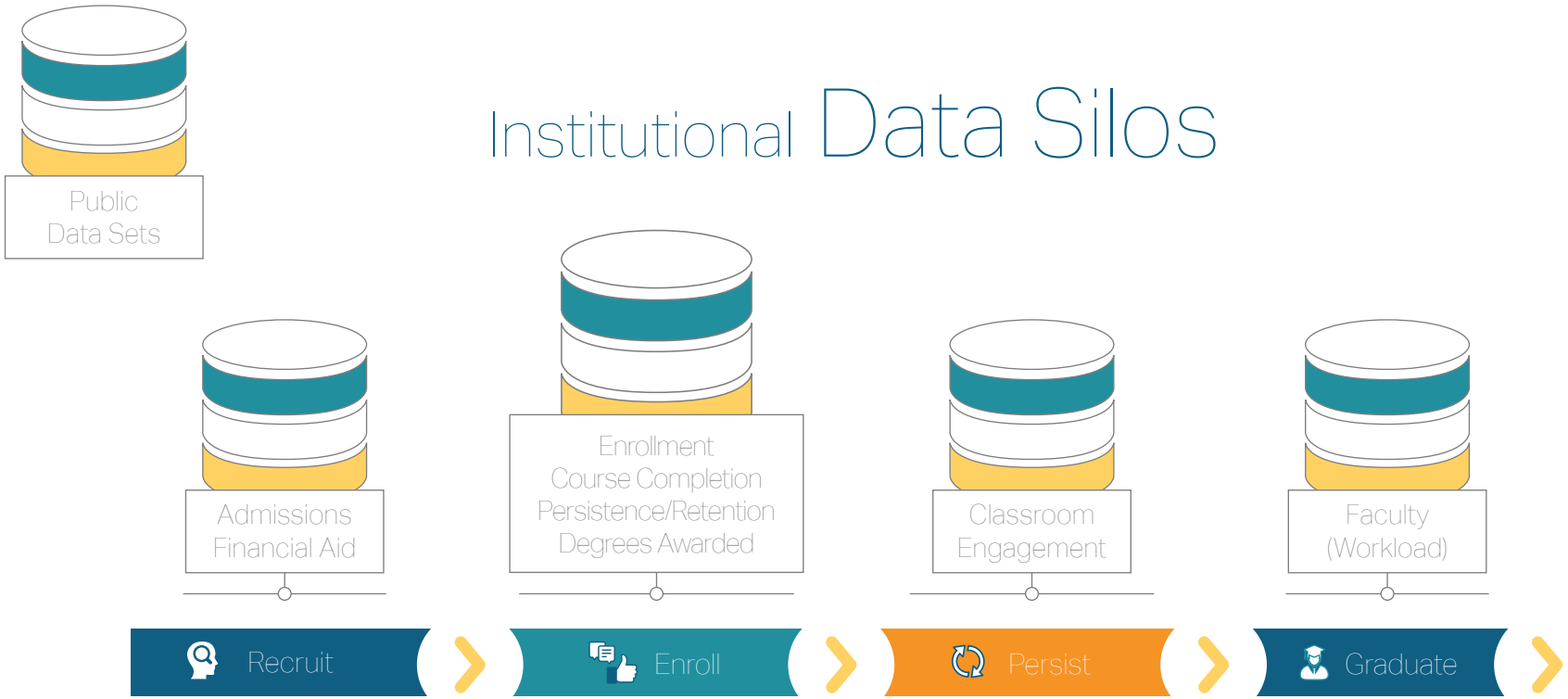
Challenge #1 Data Silos

The decentralized nature of the post-secondary system has served individual departments well, allowing flexibility and creativity to meet faculty preferences and student needs. However, silos have proven to be a barrier to leveraging analytics to identify blind spots and improve institutional outcomes.

Whereas separation offers protection, some good, such as privacy, and some bad, such as opportunities to avoid accountability, connections and relationships between data systems have to be established to drive value. The power of data is not in a single number, in a single average, or a single rate of change. **Data is most powerful when it is used to make connections and tell stories,** changing from just data to analytics. By keeping data separated, in different systems and different departments, it is easy to miss the forest for the trees. Colleges and universities need structures and tools to lift data out of silos and see the arch of the story they tell. By trying to interpret data without strong data structures in place or without a view into cross-functional data across the institution, key data points will remain out of focus and in the periphery, leading to the wrong conclusions or overreactions that can send an institution down the wrong path to solving perceived issues.

Data Silos Across the Student Lifecycle

The data silos that exist in higher education traditionally align to the student lifecycle, giving an institution's leaders and administrators a false sense of a complete analytics picture. While data will always naturally align to certain points of a student's relationship with a college or university, connecting those points to tell a full story is key to getting analytics right.



Challenge #2 No Commitment to Technology, Talent, or Time

Investing in analytics, like so many efforts in higher education, takes a holistic approach. The parts and pieces that drive effective use of data are intrinsically connected, so much so that focused investment in one area at the expense of the others can be as detrimental as making no investment at all. Instead, what is required is a measured and combined investment in technology, talent, and time. Having the right technology to collect and analyze data without trained people to extract the story the data is telling will do nothing for colleges and universities. Similarly, having knowledgeable people who do not have the time to invest in the iterative process of data discovery and refinement will produce disappointing results.

Once technology is in place, institutions must also tackle the challenge of ensuring there is enough staff available, and that those individuals have sufficient levels of data storytelling and data science expertise to analyze patterns and trends, and provide guidance on how to take action. Neglecting to provide ongoing training for staff just learning new systems or marginalizing their role by relegating them to only pulling reports instead of finding the stories within data will significantly encumber efforts to leverage insights from analytics.

> "The primary talent barrier to maturing analytics capabilities is the number of staff available to do the work, not the skills of current staff in analytics support roles."
>
> **-Eden Dahlstrom,** Chief Research Officer, Data, Research, and Analytics, EDUCAUSE in *EDUCAUSE Review*[v]

The challenges of technology, talent, and time are particularly pervasive when institutions approach analytics with a do-it-yourself method. Colleges and universities make large financial investments in technologies only to find they have limited capabilities or lack the level of extensibility needed to keep up with changing needs. Improving those technologies requires more time, and often more money. The University of Maryland University College (UMUC) for example needed $10,000,000 and 5 years to build a robust system on its own (read more about UMUC's story in a case study below).

Challenge #3 Data Immature Culture

When many in higher education talk about institutional analytics, their attention focuses on predictive analytics. In part this is driven by thought leaders from Gartner naming predictive analytics as a Top 10 strategic technology in higher education, to NASPA stating that "the use of predictive analytics and 'big data' will increase in student affairs," to other higher education leaders including it in their predictions for the space. But this is rarely a productive starting point.

Instead colleges and universities must develop and build their way through the stages of analytics maturity to reach a state of advanced analytics.

Stage 1:
Data Integration

At this first stage, institutions are defining the questions they are trying to answer now, and identifying future questions.

Primary question:
"What challenges exist?"

Stage 2:
Descriptive Statistics

Institutions are engaging in data identification, assembly, and model development to answer current and future questions comprehensively. They may also be enabling what-if and self-service capabilities to empower users across the community to mine and visualize their data.

Primary question:
"What data are available and are needed?"

Stage 3:
Visualization, Exploration, and Analysis

This stage is marked by investments in data science and data storytelling expertise to help ask and answer the pressing questions and provide guidance on how to take action.

Primary questions:
"What patterns or anomalies exist?"
"What are the areas of opportunity?"

Stage 3:
Predictive Modeling

At full analytics maturity institutions are prioritizing the questions to answer so that they align with the institution's strategic goals. Start small, show value, and grassroots success will go viral.

Primary questions:
"What might happen?"

While this concept is far from new, it is still relevant and serves as a cautionary reminder that institutions should not try and jump ahead to predictive analytics. Spending the time to glean key insights from descriptive statistics and diagnostic analyses is critical.

There is an incredible amount of actionable data and value in the early stages with understanding an institution's baseline and being able to answer the key questions of the educational enterprise. High value insights can be gleaned by focusing on descriptive statistics and diagnostic analysis to support stakeholders and provide greater visibility into the critical connections between enrollment, student success, and institutional financials. Doing these well are critical to informing any efforts to leverage predictive analytics at an institution.

"When we think about the value of analytics for an institution, we approach it through the lens of the data needed to support institutional KPIs. We believe it's important to have a balance of descriptive, diagnostic and predictive to provide the richness needed to understand the full picture and support long-term health and profitability of the education enterprise."

-Jack Neill, Vice President of Client Services, HelioCampus

The University of Maryland University College Case Study

A Focused Approach To Analytics Pays Off

As with many universities, the University of Maryland University College (UMUC) started their endeavor into analytics with a question, a question about shifts in student enrollment volume. But in the end, they discovered the challenge was not about attracting more students – or increasing the volume of students applying – it was about conversion.

After the university enrollment team started looking at the institutional data, they discovered that by simply prioritizing a call back to prospective students who reached the application phase of the enrollment process, they could improve enrollments overall. The difference that reprioritizing which prospective students received call backs first was significant – the team saw a 20 percent increase in enrollments after implementing the strategy. That increase was followed by year-over-year growth ever since. While Susie Chang, former Vice President of Student Recruitment at UMUC recognizes that it is an over simplification to pin the increase to one change, it did make a difference.

But, getting to the point where UMUC could identify that opportunity and make the change took a long time. The university first undertook efforts to collect and better use data in 2011. It was 2014 before they were in a position to analyze the data and make a change. **Being patient and investing the time to see the broad picture paid off for the institution, but it meant focusing on building a strong foundation first.**

UMUC Case Study highlights

Investment of 5 years & $10 M

Data has informed significant policy changes ranging from the length of courses to course registration procedures

20%
increase in new student enrollment in Fall 2014

7%
increase in course completion

19%
reductions in recruitment expenses

4%
increase in student persistence 2011-2015

"Getting an understanding of the baseline first was important. We needed to have a picture of the low hanging fruit, of where we could make quick improvements before getting into the more sophisticated modeling that you can do with the predictive scoring models," said Chang.

To collect that baseline information first, the university established a data analytics unit as part of what is now the Office of Analytics, Planning, and Technology. The UMUC team analyzed data and reviewed records tirelessly. They also worked with departments who were in contact with students across their lifecycle to build and adapt data dashboards for real-time analysis.

"It was a lot of work at first. The dashboards evolved every week until we landed on that final standard dashboard that was critical across the organization," said Mary Ann Donaghy, Vice President of Marketing at the University.

In addition to increasing enrollment, UMUC reduced recruitment expenses by 20 percent because analytics helped the institution target more efficiently and spend recruitment dollars more effectively.

"Over time, we were able to start looking at the cost per lead by lead type, by lead source, by audience type. Once you have the right input and the data is in there, you can slice and dice it however you want. We eventually could tell how much more likely a prospective student is to convert if we reach out to them within one hour of them completing the lead form, instead of waiting longer," said Donaghy.

For Donaghy it was proof that, "Data is power and it's essential to anybody who wants to continually improve their business results. Without the data, you're truly flying blind," she says. But she's also careful to warn, "You have to know what you are trying to achieve. Only then can the data empower you to develop a plan, a strategy, and to deliver on that goal. Without the data, you're putting words on paper, putting people in place, and crossing your fingers. Without data, you won't know if any of those changes have succeeded or failed because you don't have anything to measure them with."

Chang feels the same way. She knows data is hard work but knows it is also the key to how the university turned around some downward trends. The key to all of it is rolling up your sleeves and understanding that using data takes patience and practice.

"Data is hard work because it doesn't tell you the answer, it tells you where more exploration is needed or where you need to move in a different direction. But to get to that point you have to get into the habit of understanding the numbers and the context behind them. Every morning I log in and look at my dashboard. Only after really getting to know the numbers could I see what looks normal and what doesn't," said Chang.

UMUC continues to progress in its analytics maturity, looking for more opportunities to improve outcomes, efficiencies, and decision making. The efforts have meant big improvements for the university and even created unexpected, new opportunities for the institution. For example, in January of 2016, the Office of Analytics, Planning, and Technology took the work it had done around building proprietary technology and capabilities and spun it off into a separate company which is now HelioCampus.

"Analytics plays a key role in the success of UMUC. A growing number of senior administrators and presidents are realizing that the need to be more efficient, more effective will be met by analytics," said Javier Miyares, President at UMUC. "While institutional analytics is hard, and the journey long, the cost of doing nothing is no longer an option for higher education institutions."

4 Steps to Putting Data In Focus

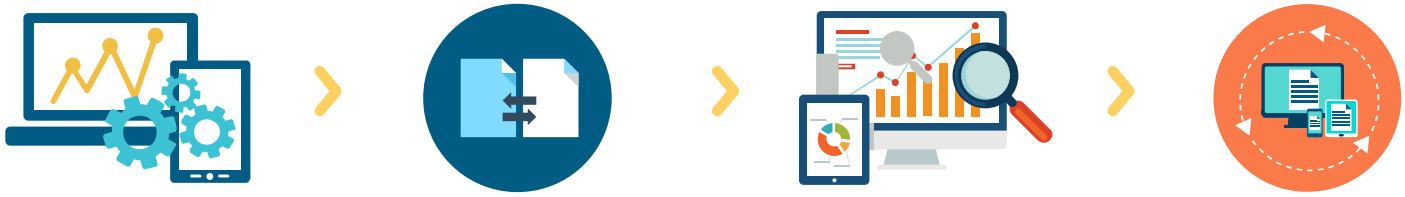
While there is certainly a long way to go for higher education to put data in focus, and it will take large investments of resources and time, it is possible. Starting meaningful conversations on campus and following four data practices ensures there is a clear path to progress and connects the dots to enable decision making across the institution.

1. **Centralize**
2. **Optimize**
3. **Visualize**
4. **Connect**

Step 1 Centralize

Centralizing key data from across the institution is the foundation for any institutional analytics initiative. Defining the types of questions administrators, faculty members, and even students might want answers to is core to determine what kind of data is collected and how it is done. Then that data must be protected to ensure its integrity. Institutions need to avoid a "garbage in, garbage out" approach to analytics. Aligning the collection and centralization of the data is a critical first step to ensuring data is of high quality and there is transparency around its collection and potential use.

Once questions and their corresponding data sources have been identified, a framework should be put in place to provide insight across the institution and effectively bridge the traditional silos. Additionally, institutional leaders need the authority and influence to refine and broaden the scope of data inquiries, and the will to embrace transparency and communicate objectively. Lastly, institutions must have a data culture in place that enables users access and insights using data across different function to define questions that need answers.



Centralize

Data is gathered from source systems and replicated into the HelioCampus platform.

Optimize

Data in normalized and modeled in a central repository.

Visualize

Data is presented in a series of intuitive and interactive dashboards.

Connect

A dedicated analyst helps you interpret the data, identify key trends, predict and take action.

Step 2 Optimize

Institutions must focus on optimizing their data by building out an infrastructure that enables institutional leaders and functional users to explore, connect, test assumptions, and analyze their data. This high-value analysis provides that next level of insights institutions need which traditional operational reporting tools cannot provide. Extensible data models help efficiently identify and capitalize on the connections and relationships between multiple data sources and contexts versus single-threaded reporting. To truly optimize their data, institutions will have to make serious commitments to resources. Investments in high-performance computing, data integration and modeling, an intuitive data-visualization platform, and expertise in data storytelling and data science should be a priority. The platform institutions choose also needs to be extensible and flexible enough to grow and expand as the college or university's needs evolve, as well as make it easy to analyze data across systems and add additional datasets.

Step 3 Visualize

The abilities to uncover insights and translate into actions or business outcomes are critical for improved insight-to-value conversion rates. This is often easier said than done. The problem is that numbers alone do not represent the whole picture. As data visualization expert Stephen Few said in a Forbes article, "Numbers have an important story to tell. They rely on you to give them a clear and convincing voice." The key is having the expertise to give data that voice.

Some people are comfortable looking at numbers but have trouble drawing connections and extracting stories from them. Others are not comfortable with data at all, easily getting overwhelmed by reports and models. This is where investment in data analysis and storytelling expertise is of value for higher education. All stakeholders need training to build up data science and storytelling expertise, but especially the people who will be looking at the analytics most – the power users. Appropriate support and training for these data professionals empowers them to be proactive and engage the university community in a significantly different way in order to facilitate meaningful conversations. **This will also help teach these data storytellers how to take the complexity out of institutional data and present it in an easily understood and consumable fashion to leaders and stakeholders across campus.**

5 Questions "In Focus" Data Can Answer

1. How can we break down students into sub-populations to better serve them?
2. Are we discounting tuition for the right students?
3. Which degree programs are driving demand, degree production, and margin?
4. Are there significant opportunities to improve student persistence?
5. What are my degree completion patterns and how do we improve time to degree?

Step 4 Connect

Technology and subject matter expertise alone will still not provide institutions with the ability to put data into focus. Institutional culture and a will to purposefully evolve to a data-driven organization are critical components. Despite an institution's best efforts, as its analytics maturity advances, organizational silos can persist perpetuating a lack of visibility into hidden insights. It is crucial, then, for institutional leaders to remain committed to putting practices, policies, and leaders in place that foster connections across the organization and support the evolution to an evidence-based culture. As the research and advisory firm Gartner notes in its research, Data and Analytics Leaders Key Initiative Overview, data and analytics leader roles are needed to "help organizations use the most impactful data, so that they can analyze, collaborate, and make more effective decisions."

There are several approaches to connect a campus. One approach is the "Networked Leadership" model outlined in the ACE publication, Evolving Higher Education Business Models. Networked Leadership calls for leaders to "increase transparency, empower frontline community members, and guide performance standards and metrics," and serves as a strong blueprint for an integrated transition towards institutional performance based on a common set of metrics.

Another, not entirely separate, approach is creating a layer of independent and objective oversight, like an Office of Data and Analytics, that can bridge connections across organizational silos and build a culture of data-driven leadership at all levels of the institution. While the roles and responsibilities of such an office may already exist at many institutions, they are often decentralized. A centralized office, acting as an independent actor can facilitate the use of impactful data to make effective decisions, inform institutional practices, and help drive a purposeful, cultural evolution. Increasingly, institutions are creating data-focused roles on campus as well. Titles such as Chief Data Officer, Vice President of Analytics, and Data Analyst are becoming more common, while simultaneously analytics are a growing part of the roles of student success professionals and academic advisors.

Conclusion

As higher education institutions put in place practices to put data in focus and develop their analytics maturity, it is important to keep in mind that the numbers are not the end goal. The ultimate goal is to find ways to impact students' individual experiences across their lifetime relationship with their college or university. From considering whether to apply to an institution, to enrollment, to the first day of class, through graduation, and establishing an alumni relationship with an institution, analytics can help shape those experiences to be the best they can be. Institutional analytics can also drive key decisions to help support pressing issues like increasing access and diversity, while simultaneously building the right student success supports for all students.

But getting to the point of making those critical decisions – of having data that is truly in focus, takes hard work. Colleges and universities need to make the right investments in technology, talent, and time to use analytics to see the stories happening across campus, connect silos, make better informed decisions, and prioritize based on fact instead of intuition.

Following the four data best practices outlined in this report is the first step. Those practices will ensure institutions have the right foundation and technology and the necessary data visualization and storytelling capabilities to support ongoing analyses that lead to action. Institutions looking to touch on all of these features in a do-it-yourself model, should also keep in mind doing so is resource intensive and oftentimes leads to a high level of investment with a low ROI, resulting in analytics project fatigue.

Still there is hope that these endeavors can be successful. High profile cases of how analytics help transform campuses can be found. Cases like UMUC's, presented earlier, serve as a beacon of what is possible, demonstrating that using institutional performance analytics effectively can impact the institution-critical goals of supporting student success, access, and diversity. However, it's not possible without visibility across the entire institution, and seeing the true story within data. Only then can institutions use analytics to increase overall health and long-term sustainability.

References

[i]Moving the Red Queen Forward: Maturing Analytics Capabilities in Higher Education. Dahlstrom, Eden. EDUCAUSE Review. 22 August 2016. http://er.educause.edu/articles/2016/8/moving-the-red-queen-forward-maturing-analytics-capabilities-in-higher-education

[ii]Big Data's Coming of Age in Higher Education. Burns, Bridget Forbes. 29 January 2016. http://www.forbes.com/sites/schoolboard/2016/01/29/big-datas-coming-of-age-in-higher-education/#6199e39c2a32

[iii]UB Higher Ed Administration and Management Survey. University Business. 2014. https://www.universitybusiness.com/article/outlook-administration-campus-leadership-challenges

[iv]http://www.eduventures.com/2015/09/educational-intelligence-should-be-in-your-vocabulary/

[v]Moving the Red Queen Forward: Maturing Analytics Capabilities in Higher Education. Dahlstrom, Eden. EDUCAUSE Review. 22 August 2016. http://er.educause.edu/articles/2016/8/moving-the-red-queen-forward-maturing-analytics-capabilities-in-higher-education

[vi]Gartner Highlights Top 10 Strategic Technologies for Higher Education in 2016. Gartner, Inc. 25 February 2016. http://www.gartner.com/newsroom/id/3225717

[vii]NASPA Right Now – January: Thoughts and Predictions for 2016. Kruger, Kevin. NASPA Student Affairs Administration in Higher Education. 5 January 2016. https://www.naspa.org/about/blog/naspa-right-now-january-thoughts-and-predictions-for-2016

[viii]Leaders Give their 2016 Higher-Ed Predictions. Stansbury, Meris. eCampus News. 4 January 2016. http://www.ecampusnews.com/top-news/2016-higher-predictions-872/4/

[ix]Data Storytelling: The Essential Data Science Skill Everyone Needs. Dykes, Brent. 31 Mar 2016. Forbes. http://www.forbes.com/sites/brentdykes/2016/03/31/data-storytelling-the-essential-data-science-skill-everyone-needs/#544c8916f0c8

[x]Data and Analytics Leaders Key Initiative Overview. White, Andrew. Gartner. 05 February 2016. https://www.gartner.com/doc/3200328?plc=ddc

[xi]Evolving Higher Education's Business Models. Soares, Louis, Patricia Steele, and Lindsay Wayt. American Council on Education. 2016. https://www.acenet.edu/news-room/Documents/Evolving-Higher-Education-Business-Models.pdf