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# Data with Purpose

## Developing data maturity and analytics strategies for cross-institutional insights

- How can institutions use data to connect all lines of business?
- What role does data management play in improving the student experience?
- How can effective data management and governance impact overall institutional success?

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# Data with Purpose

## Developing data maturity and analytics strategies for cross-institutional insights.

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# Summary

## Catalyst

Like all other industries, higher education has been making great strides to become more data driven. Gaining greater insight into the way in which students, staff, and systems all interact with each other across an entire educational ecosystem or campus is critical in ensuring institutional and student success. In Ovum's *ICT Enterprise Insights 2018/19 – Global: Education* survey, 24% of institutions globally ranked analytics as their top priority for 2018/19, while 61% of institutions ranked it as one of their top three projects. However, adoption and implementation has been slower in higher education than among other industries, because of cultural, financial, and technical barriers. It is critical that schools create an effective strategy to derive and manage the data and analytical insights they seek to facilitate institutional transformation.

## Ovum view

Before an institution can create a connected, data-led campus strategy, it is imperative that the school assess and understand its level of data maturity. Establishing data management and governance practices and managing the integration of data across systems are key in achieving a data-centric culture. While it is no small task to integrate and manage student data points, which might be found in hundreds or even thousands of tools and systems (from social media to learning management systems [LMSs] and student information systems [SISs]), it is integral to providing the kind of consistent, informed experience that modern students expect.

This report explores some of the challenges and drivers for institutions in adopting and implementing analytics, assesses the current state of analytics at higher education schools, and provides some cultural and technical recommendations for creating a more cohesive view of the institutional experience. It discusses analytical advancements for higher education, including embedded analytical capabilities within business applications (such as the CRM or LMS), which enable end users to derive insights to augment their own decision-making. In addition, the use of AI-enabled technologies can increase efficiencies in traditional analytics as well as delivering new insights. This more advanced stage of analytics, known as predictive or prescriptive analytics, can suggest interventions or make recommendations to further increase student success, provide recommendations for staff, and improve overall institutional initiatives. To remain competitive, schools should now have the basics of student success, retentions, and institutional effectiveness analytics well underway, as the leading institutions are now using AI to enhance learnings and action.

## Key messages

- Analytics is a key interest for institutions, but many barriers stand in the way.
- Data centricity is a fundamental, yet still maturing, element of digital transformation for higher education.
- Effective data management and governance are foundational to success.
- Higher education analytics adoption is on the rise.
- Descriptive, predictive, and prescriptive analytics enable cross-institutional insights and student centricity.

# Recommendations

## Recommendations for institutions

When embarking on an analytics initiative, institutions should think strategically but implement incrementally. It is vital to consider the business and academic areas of the institution that would best benefit from analytical insights and where data gaps from existing business intelligence and data warehouses might be. Starting with one or two areas (e.g., recruiting or learning analytics) and deriving results from that will lead to more organic growth and buy-in.

As analytics becomes a responsibility of business users (and not solely the domain of institutional research data scientists, as in previous generations), it is important that users have an intuitive and visually compelling experience as they explore the data trends, growth, and decline over time in a way that enriches their business role. Identifying systems that provide data visualization tools for simple and effective storytelling techniques will encourage this experience.

Analytics can often be embedded within existing processes. This enables business users to drill down into data and interrogate it themselves via intuitive, user-friendly dashboards and visualizations. Predictive analytics can be particularly powerful when used this way.

Many of the challenges with analytics implementation (or any technological implementation) are cultural. As analytics use cases are developed in one line of business, communicate the successes and failures with the overall organization, so that other business areas can start to plan for their own analytics strategy.

## Recommendations for vendors

Make sure it is easy to integrate products with other systems across the campus. Adhering to common data definitions, such as the US's Common Education Data Standards (CEDS) will ensure data interoperability and make it easier for institutions to manage integrations with other CEDS-adhering systems.

It is important for vendors that work with institutions to carefully assess their own readiness to serve as a true partner in institutional transformation, not just product implementation.

As predictive analytics is based on historical data and patterns, it has the potential to amplify bias. Vendors creating such tools should make sure that there is transparency about the predictive modeling and decision-making that has led to these recommendations. It is equally important that institutions do not simply take these recommendations as truth, but make sure to interrogate and identify any biases, especially when it comes to recruitment or admissions. Doing so is an imperative for establishing a responsible, data-driven culture that adheres to the institutional mission.

# Data centricity at higher education institutions is the foundation to analytics

Analytics, as the name suggests, is an analytical examination of data itself, and a way to understand how constituents are interacting with the campus. It can facilitate data-rich decisions based on transactional, operational (such as from IoT sensors or trackers), and social data, as well as data from

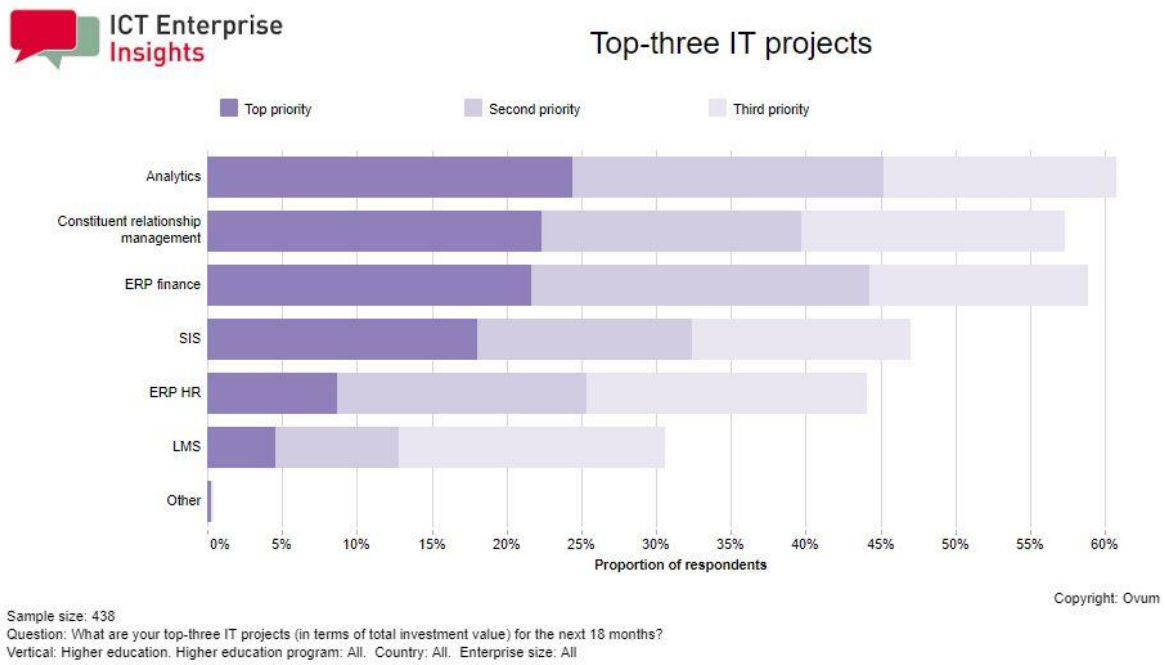
 

traditional institutional systems like the SIS and LMS. In doing so, it drives a better campus experience for students, in which their digital experience matches that of their consumer technology (e.g., predictive recommendations based on things such as career preferences, intended major, most utilized resources on campus, or social media interactions). Yet this end goal – creating a more connected institutional environment and a more personalized individual experience – is easier said than done.

## Analytics is a key interest for institutions, but many barriers stand in the way

Ovum's *ICTEI 2018/19 – Global: Education* survey revealed that analytics is the most popular project for institutions globally: 61% of respondents indicated it ranks among their top-three IT projects for 2018/19, and 24% total ranked it as their number one priority (Figure 1).

**Figure 1: Priority IT projects for higher education institutions 2018/19**

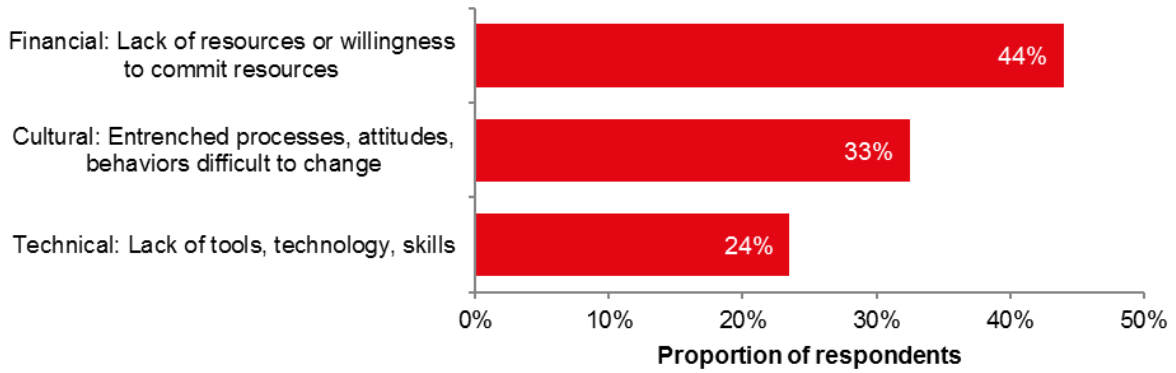



Source: Ovum, ICT Enterprise Insights 2018/19 – Global: Education

While the value of using data to connect all lines of business (and systems) across an enterprise is clear, it is equally apparent that along the path to achieving data centricity there are many technical, cultural, and financial challenges. A 2018 Ovum survey of 200 C-suite executives in North America polled analytics usage at their higher educational institutions. The greatest barrier to a comprehensive analytics initiative was financial constraints (the lack of resources or willingness to commit resources). Cultural barriers of entrenched processes, attitudes, and behaviors were the second greatest impediment at 33%, while 24% of respondents believe that the greatest barrier at their institution is technical issues (lack of tools, technology, and skills).

**Figure 2: Relative importance of barriers to analytics adoption**




Source: Ovum Higher Education Analytics Survey, 2018

Analytics is currently a major priority for many institutions not only because of its many benefits but also because the process of data management – collecting, standardizing, and storing data – for analytic purposes is still relatively immature and disorganized. A successful analytics initiative must overcome these barriers in a practical, measured way that starts with meeting an institution at its current state, and provides practical measures to evolve into a more data-centric organization. This strategy will require the participation of many C-suite, IT, and line-of-business users, but it will enable an institution to become more data-driven and use analytics in a meaningful way, such as to improve the constituent experience or to optimize business efficiencies across the enterprise.

## Data centricity is a fundamental, yet still maturing, element of digital transformation for higher education

In Ovum's *ICTEI 2018/19 – Global: ICT Drivers and Technology Priorities* survey, Ovum assesses the digital maturity of all industries (including higher education, retail, and utilities), and more specifically, the percentage of enterprises in each industry that have fully established and enacted digital transformation in terms of specific endeavors (e.g., creating a digital workplace strategy for staff). This table demonstrates that higher education, while more mature than some industry verticals such as government and healthcare, lags behind the overall industry average in all categories. For comparison, we have also included the telecoms vertical, which is the most mature of all industries.

**Table 1: Percentage of enterprises with complete digital transformation**

| Digital transformation strategy | All industries | Higher education | Telecoms |
|---|---|---|---|
| Omnichannel customer engagement strategy | 9.7% | 8.7% | 11.1% |
| Establishing a clearly articulated digital strategy | 11.5% | 8.9% | 19.6% |
| Creating new digital products or services | 13.1% | 8.9% | 18.0% |
| Digital workplace strategy for staff | 15.2% | 13.2% | 16.1% |
| Exploiting the value of data across the business | 12.9% | 9.4% | 17.4% |
| Recruitment and training for digital skills | 14.4% | 12.1% | 17.7% |
| Digitizing back-office processes | 14.0% | 12.8% | 14.9% |
| Support for a digital culture | 15.5% | 14.2% | 19.3% |
| Proactive approach to cybersecurity/digital risk | 14.5% | 12.1% | 15.8% |

Source: Ovum, ICT Enterprise Insights 2018/19 – Global: ICT Drivers and Technology Priorities

All industries have been slow to execute the exploitation of value of data across the entire enterprise. Less than 10% of higher education institutions have achieved a complete strategy for using data across the entire business, a figure that lags 3.5% behind all other verticals (and a substantial 8.0% behind the telecoms industry).

# Effective data management and governance are foundational to success

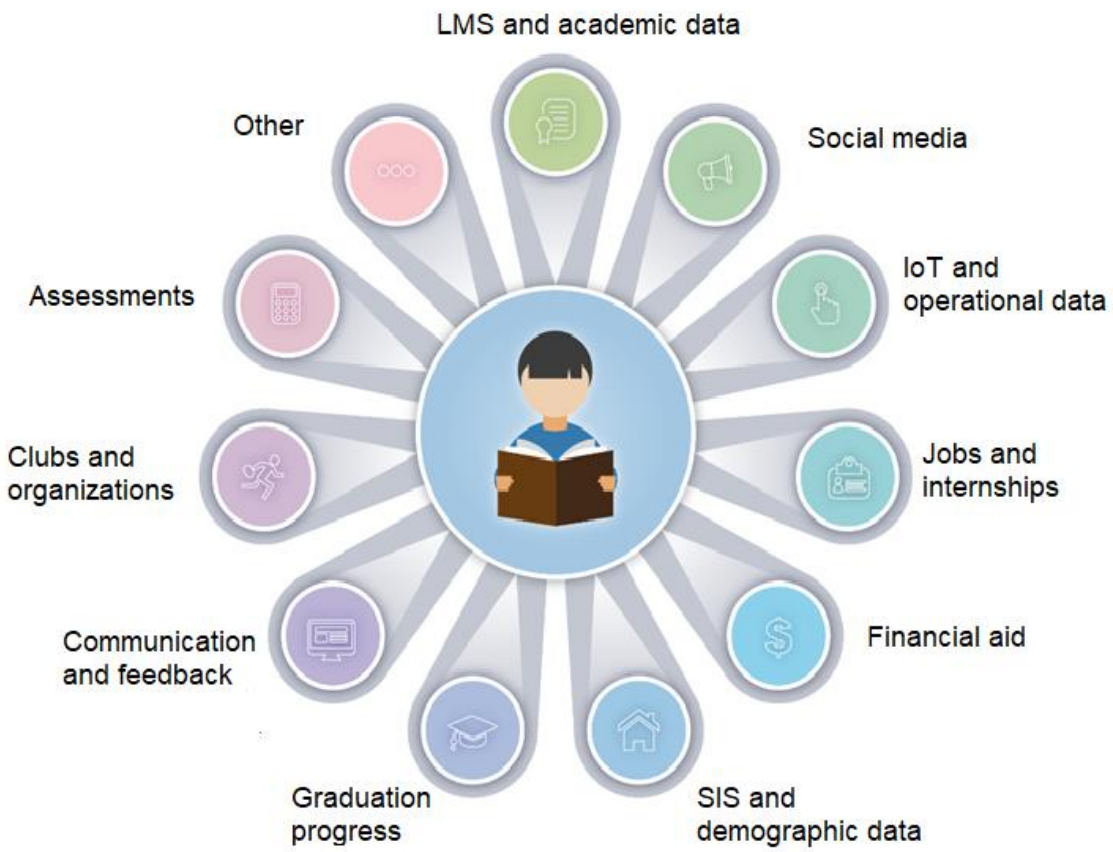
The integration and management of institutional data is one of the most important and difficult elements when taking on an analytics initiative. This data is often siloed and does not flow easily from system to system, and as a result it is difficult to ensure that it remains accurate and up to date. Adding to this integration issue is the variety of data formats: structured or transactional data (data that can be readily mapped and organized in a database), semi-structured (i.e., data that has some organizational properties that enable analysis), and unstructured (data that does not readily fit into a database (common examples include images, emails, documents, and social data).

Nonetheless, linking together these different sources of data – from social media and IoT data to student grades and financial aid information – is imperative to providing the unified student or constituent experience expected at a modern institution (see Figure 3). A student might have many

roles at a university: they might be currently enrolled in one undergraduate program, applying to a graduate program and internships, and employed as an on-campus worker or a resident assistant. Being able to connect these different data points, which might reside in different systems, is important for delivering the 360-degree student profile that will enable the institution to serve up the kind of personalized experience and services that the student might expect (e.g., receiving an alert about a due date for their graduate application).

**Figure 3: Sources of student data**




Source: Ovum

Data governance is a fundamental issue. Ensuring the successful management of data in a multiregulatory environment (e.g., GDPR for EU citizens, HIPPA and FERPA for US citizens) requires the establishing of core governance protocols in advance across the enterprise. Privacy is key: institutions should ensure that the data collected for reporting purposes is anonymized, used ethically, and destroyed when not in use.

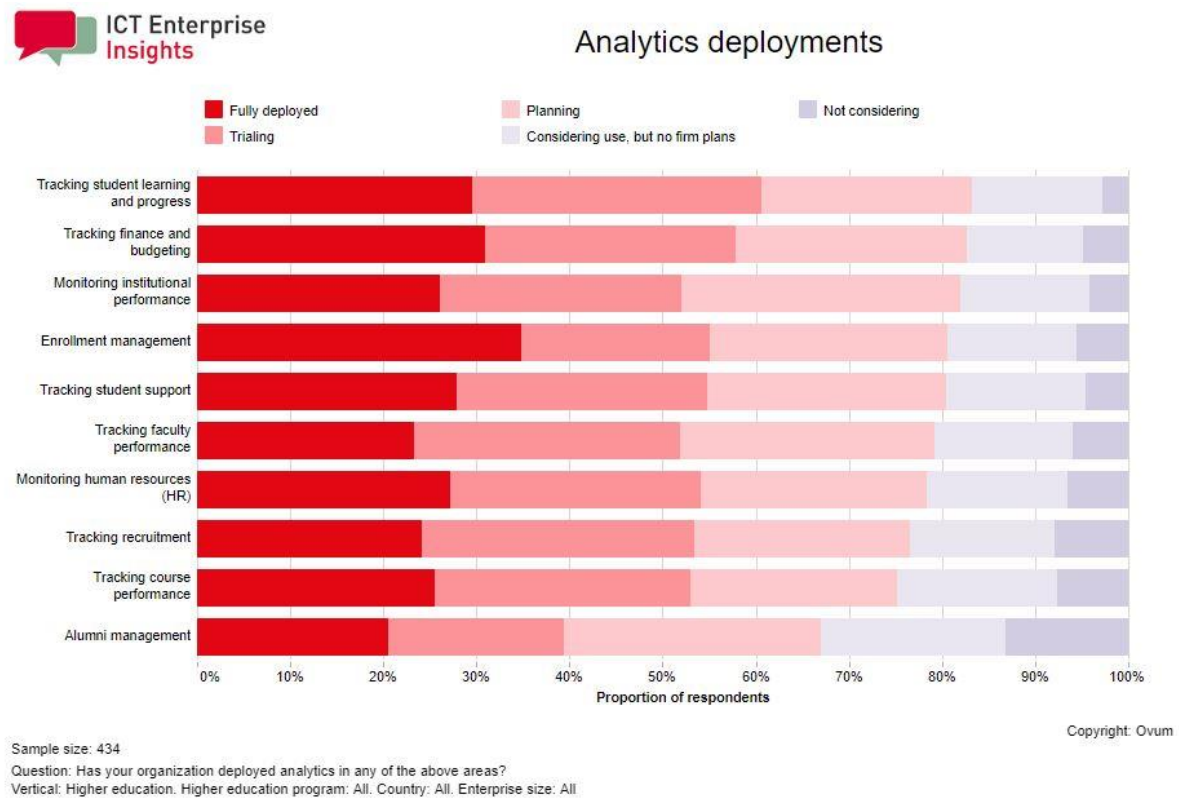
Any data governance initiative requires a closer look into the people and processes at an enterprise. It might lead to establishing the position of a chief data officer, who would serve as the executive sponsor for a data organization, with representatives from both IT (data stewards, who would manage the technical administration of data) and business departments (who would serve as data owners, responsible for how that data is used within their department and shared with others). Planning cross-organizational support (e.g., training courses with tips, best practices, and use cases) for managing data and using analytics is another important part of becoming a data-led organization.

# Higher education analytics adoption is on the rise

Results from Ovum's *ICTEI 2018/19 – Global: Education* reveal that the majority of institutions are still in the initial stages of their analytics capabilities. Figure 4 shows that the average for analytics usage in active deployment across different institutional departments is 26%, while two-thirds of all institutions are still in the trialing, planning, and consideration stages.

**Figure 4: The current state of analytics across various business lines**




Source: Ovum, ICT Enterprise Insights 2018/19 – Global: Education

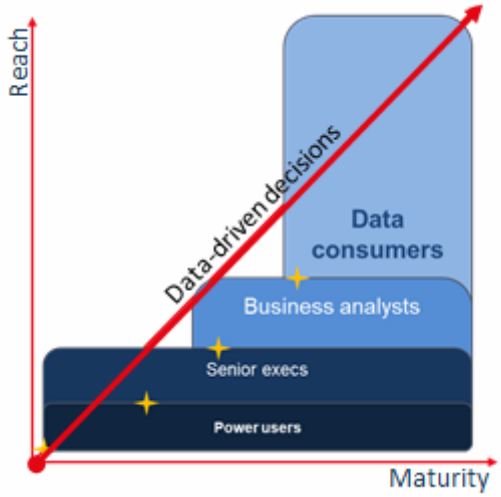
What is encouraging to note is that usage – and interest – across all departmental deployments has increased even over the last year. In the 2017/18 survey the average percentage across all lines of business for analytics deployment was 26%, while the average percentage of full deployments across all institutions has grown one percent to 27% for 2018/19, and the average for institutions actively trialing analytics tools has climbed from 24.7% to 26.2%, an increase of 1.5%. These figures, while admittedly not the most dramatic, demonstrate that analytics across all business lines is more important than ever.

## Embedded analytics facilitates greater reach at the department level

The advancement of an analytics initiative includes two factors: maturityand reach **.** Maturity is the quality and breadth of data collected, as well as the capabilities of the tools used. Reach pertains to the number of users who have training in and access to these tools, and therefore can use the data to give them the insights to successfully perform their role (see Figure 5).

**Figure 5: Two dimensions to growth: maturity and reach**




Source: Ovum

Many vendors with solutions for specific business areas (e.g., CRMs for recruiting or advising) have embedded analytics tools that make it easy for those users to see key patterns and drill down into student information: for example, an advisor might be able to see the biodemographic information of assigned students, their current GPAs, and range of majors. While these systems all come with descriptive analytics capabilities, some systems offer more advanced capabilities, such as predictive or prescriptive capabilities (to be discussed in the next section).

Embedded analytics at the departmental or end-user level is one of the primary drivers for making enterprises as a whole more data-driven and making trustworthy data and insights more accessible across a broad number of users. Such code-free, drag-and-drop capabilities allow users to experiment with data and develop a clearer understanding of how this data can help them improve the efficacy of their role.

As a result of a more end user–driven experience, natural language processing is more important than ever for business users who may lack the technical and jargon-heavy terminology of data scientists. It should be easy and intuitive to query and manipulate data in a code-free way without requiring additional support (via visualizations or dashboards, for example), and to represent this data in a visually compelling way. The analytics platform or tool should allow flexibility, as some users may require a simple, static interface, while others might want to interact with their data in more complex, dynamic ways, and enable collaboration with others.

# Enterprise analytics enable cross-institutional insights and student centricity

While the data from Figure 4 shows the usage of analytics in individual areas, Ovum believes the greatest value from analytics implementations is from an enterprise-wide approach, which can create and provide users with rich, individualized insights that can positively affect their institutional experience. For example, while LMS vendors such as Instructure, Blackboard, and D2L all provide predictive learning analytics to optimize the teaching and learning experience for their users,

institutions can better leverage such insights by connecting the analytics to other student-facing systems for a 360-degree view of the student.

Many vendors in the higher education industry, including Jenzabar and Ellucian, are providing their customers with cloud-based analytics platforms that bring together different analytics tools along with data management, processing, and storage systems (both cloud based and on premises) via APIs or other prebuilt connectors for a single, unifying source of truth. A platform approach to analytics implementation can benefit other institutional missions, such as increasing operational efficiency: for example, an IoT initiative would require combining data from different sensors and systems and figuring out when buildings or facilities are underutilized.

## The analytics evolution: Moving to predictive and prescriptive analytics

Cloud-based systems often connect a broad range of analytical tools that make the most of AI-enabled technologies. In doing so, Ovum sees an evolution from a retrospective to a prospective lens for institutions using analytics: a move from descriptive or diagnostic analytics toward predictive and prescriptive analytics. This next stage of analytics is built on AI-enabled technologies, such as machine learning, which require accurate, real-time data to be shared for maximum efficacy.

While descriptive analytics examines current and historical data points on KPIs and other important metrics, predictive analytics forecasts future trends (e.g., the likelihood a student has of graduating on time, or of failing a course). Ovum's *ICTEI 2018/19 – Global: Education* survey reveals that only 14% of institutions are deploying predictive analytics in some capacity, while 60% are trialing or planning to implement it at their school in the next 18 months. Prescriptive analytics is an even more advanced phase, in which the system makes recommendations for next-step actions (e.g., if a student is at risk of failing a course, the system might suggest signing them up for a tutor or reviewing certain parts of the coursework that they did most poorly on).

As mentioned, predictive and prescriptive analytics are important elements of current analytics tools. Predictive analytics tools from vendors such as Oracle and Workday enable an institution to improve the level of services it provides to its constituents. For example, algorithms can identify courses that have historically been in heavy demand and make recommendations to a registrar to provide more of those courses to meet student need. Such a decision can have a significant impact, affecting things such as completion rates and student satisfaction, and even help inform hiring or course planning decisions for professors.

Some vendors are developing prescriptive tools to analyze historical data in a system and use machine learning to describe courses of action and then score the likelihood of success for each recommendation. For example, Salesforce's Next Best Action tool provides insight into whether a prospective student would react more favorably to a text from a recruiter versus a call with a current student in the prospective student's program of study. In this way, advanced analytics can provide the personalized approach to the student experience that an institution needs to best support and attract constituents.

When using predictive or prescriptive analytics, customers are clamoring for greater transparency from vendors about how their products and platforms are accruing results. While these results can sometimes be "black box" (algorithms that are self-taught or built on machine learning, in which the results might be opaque to the end users), users are asking for the ability to trace the reasoning that

has led to the system's recommendations. This is increasingly important when seeking to overcome bias.

### Cloud-hosted platforms and tools increase value

The cloud has been a key enabler for a platform-based approach to analytics – and connecting the institution as a whole. Using cloud-hosted tools and technologies to run analyses on institutional data offers the potential for financial cost savings and business efficiencies. Security and risk management in the cloud offer greater protection and sophistication than locally hosted environments, with vendors' cloud security experts working to ensure that any vulnerabilities are patched, and environments remain protected. As customers are billed only when using cloud services (pay-for-use), cost savings can be substantial while enjoying the benefits of its (hypothetically) infinite storage and computing power.

Moreover, moving to the cloud offers institutions the ability to experiment with new data management technologies to store large data sets, manipulate and translate different data types, and analyze data in real time, rather than commit to a costly, initial investment in those tools. This can be especially important for researchers, who might be looking for new ways to streamline their data transfer or compute capabilities, on a level that exceeds the general data and analytics capabilities of an institution.

## The future of data centricity/analytics capabilities

Ultimately, cross-enterprise data centricity and analytics initiatives will increase the ability to better support institutional core missions, such as increasing constituent satisfaction or decreasing operational costs.

Schools should identify top business objectives – for example, reducing time to completion rates or increasing graduate rates – and then build out the data management and analytics initiatives necessary to accomplish those results. While this might sound like obvious advice, it is in fact a challenging endeavor, and one that is impossible without getting cross-institutional communication and collaboration between faculty, staff, and IT.

Just as with establishing data governance, there must be strong executive sponsorship for an enterprise-wide analytics initiative. Of the institutions surveyed in Ovum's analytics survey, 23% named a senior-level administrative staff member as their biggest analytics champion. Many of those institutions shared that this was instrumental in getting the funding and partnerships necessary to achieve success. Different departments should also elect (or find a volunteer to serve as) a point person as the representative for the specific use cases and cultural issues that their organization might be facing.

Prioritizing simple and quick wins is important, especially at the beginning of an analytics initiative, as they will demonstrate ROI and snowball support in moving toward an enterprise-wide approach. For example, connecting data from LMSs to advising systems can ensure that at-risk students receive timely interventions and support (thus reducing the potential for them to drop out). Then a school might connect these insights to other data that can further enrich the student experience (e.g., integrating with a career portal to recommend potential career or internship opportunities aligned to the student's academic interests). In doing so, analytics initiatives can enable institutions to engage with users at the right time and create student-centric experiences.

Establishing a center of excellence (CoE) to manage analytics support and training can further align business and IT users. It can also empower business users to create and manage their own data journeys such as experimenting with more advanced ways to use analytics tools to advance their own business objectives. In doing so, institutions can ensure that a data-centric and analytics-driven culture will continue to flourish and drive business transformation in a myriad of ways.

# Appendix

## Methodology

This report was produced through a combination of primary and secondary research. Primary research included discussions with colleges and universities, as well as ongoing briefings from software, hardware, networking, and services vendors serving the higher education industry. The author also drew on Ovum's annual primary research conducted with IT decision-makers.

Secondary sources of information included company reports and websites, international organization statistics, national and international industry associations, SEC filings, broker and analyst reports, and business information libraries and databases.

## Further reading

*Building a Blueprint for the Data-Driven Enterprise*, INT002-000197 (January 2019)

*ICT Enterprise Insights 2018/19 – Global: Education*, PT0141-000005 (October 2018)

*Increasing Insights Across the Institution*, ENV006-000043 (December 2018)

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## Ovum Consulting

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