Bridging the Information Gap in Higher Education

Linking data to improve student success
Summary

Catalyst

Higher education continues to change and transform at an accelerated rate. Traditionally, institutions were primarily focused on enrollment; now they are being held accountable for student outcomes. This transformation is a direct result of evolving student demographics, increasing competition between institutions, concerns with affordability, increasing demands from employers, and new expectations from students. For institutions to remain viable, there is a need for data-driven insights to create a personalized experience for students.

Student success efforts call for greater insight or a holistic view of the student lifecycle more than ever before. Typically, student data is stored in disparate systems, making it difficult to analyze.

With tight budgets and the urgency to improve student outcomes, replacing current core administrative solutions is not always optimal for student success initiatives. This leaves institutions seeking innovative solutions that can centralize data locked in existing systems and deploy advanced data analytics tools that can plug directly into curated data prepped for analysis.

Ovum view

Improving student success is one of the most important issues faced by higher education. Advancing student success efforts requires a holistic view of the student that cannot easily be realized if data is locked in disparate systems. Moreover, there is a lack of integration and interoperability between core systems.

To overcome these obstacles, institutions can think about this a different way. For example, University of California San Diego (UCSD) elected to centralize data from its legacy environment prior to replacing it with a student system. The advantage of this approach was that it became deeply familiar with the data and identified shortcomings in the existing student system that became requirements for the new system.

Key messages

- There is a shift to support student success in higher education, as 46% of institutions are planning to improve the customer (student) experience.
- Analytics is a top IT priority, with 32% of institutions indicating that it’s their number one priority over the next 18 months.
- Emerging in the market are advanced data analytics tools that can plug directly into centralized data repositories for real-time analytics.
- Student success efforts can be advanced by centralizing student data locked in current systems. This exercise enables staff to deeply understand the data. Analytics tools can plug directly into curated views built for analytic purposes.
Higher education sharpens the focus on student success

Improving student outcomes is key to ensuring institution viability

To remain viable in today's higher education market, institutions are under significant pressure to shift their strategies from enrollment to improving student success. This pressure is driven by a myriad of powerful forces such as stronger competition, a diverse student population, demands from employers, and new expectations from students.

![Figure 1: Forces driving higher education transformation](image)

Source: Ovum

Today's student body is diverse, made up of first-generation digital natives who bring a new set of expectations to their educational journey. Not only are today's students consumer-driven and concerned with the costs of a post-secondary education, but they also expect immediate, 24x7 access to people and services.

Meeting the expectations of today's students requires higher education to improve the student experience. According to Ovum's ICT Enterprise Insight Survey 2017/18, 46% of institutions said they are planning to improve the customer (student) experience. Improving the student experience requires institutions to examine student data to discern patterns of student behavior and improve student outcomes.

Data-driven insights will guide the transformation of institutional operations to personalize learning experiences based upon a student's needs, academic abilities, and employment goals. This
transformation calls for institutions to take a student-centered approach to redesign academic programs and services. Given the strong competitive landscape and concerns with college affordability, institutions will need to balance any operational changes with efficiency. This is exemplified by Ovum's ICT Enterprise 2017/2018 survey (Figure 2), in which over 60% of institutions said that increasing operational efficiency is one of their top three business challenges.

**Figure 2: Top business challenges – higher education**

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Top priority</th>
<th>Second priority</th>
<th>Third priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing revenue/budget growth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increasing operating efficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reducing operating expenditure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improving customer/citizen experience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meeting regulatory demands</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transforming business capabilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improving operational resilience</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Ovum ICT Enterprise Insights 2017/18

A focus on student success repositions IT strategy

Student success initiatives can't wait for administrative system replacements

As the competitive landscape narrows, and pressures mount to rapidly improve the student experience and outcomes, the importance of core administrative systems is elevated. Complete replacement of core applications is rapidly becoming a viable IT strategy, as new solutions have been introduced to the market that offer more agile and integrative capabilities. These new offerings are designed to deliver the personalization that students want, while providing administration with the tools they need to track student progress throughout the student lifecycle.

However, not every institution is able to immediately "rip and replace" its existing systems. The decision to replace depends on the complexity of the institution, the areas of the value chain of delivery in need of transformation, the speed at which change is desired, the financial and other resources available for the project, and the readiness of the organization to implement change.

A viable alternative to replacing core administrative systems is to leverage the current IT infrastructure using a best-of-breed approach, where investments are made by supplementing current systems with
specific functionality as priorities emerge. This best-of-breed approach is reflected in the investment plans of institutions.

**Figure 3: Investment plans for upgrading core administrative systems**

<table>
<thead>
<tr>
<th>System</th>
<th>Strategic investment planned</th>
<th>Minor investment planned</th>
<th>Maintain existing investment</th>
<th>No investment plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIS</td>
<td>30%</td>
<td>10%</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>ERP finance</td>
<td>25%</td>
<td>15%</td>
<td>45%</td>
<td>15%</td>
</tr>
<tr>
<td>ERP HR</td>
<td>20%</td>
<td>20%</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>LMS</td>
<td>15%</td>
<td>25%</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>Constituent relationship management</td>
<td>10%</td>
<td>30%</td>
<td>50%</td>
<td>10%</td>
</tr>
<tr>
<td>Analytics</td>
<td>5%</td>
<td>45%</td>
<td>40%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Proportion of respondents

Source: Ovum ICT Enterprise Insights 2017/18 – Global: Higher Education

Ovum’s ICT Enterprise Insights survey (Figure 3) shows the upgrade investment plans, by solution, over the next 18 months. Investments to upgrade existing core administrative systems are planned by nearly 90% of institutions over the next 18 months. With student success being an immediate and top priority, it is not surprising that investments are planned for student-centered systems. Only 13% of institutions have no investment plans to upgrade their student information systems (SISs), making SISs the number one solution to upgrade, followed closely by learning management systems (LMSs).

Whether replacing or taking a best-of-breed approach, data analytics can offer significant value to student success initiatives by providing meaningful patterns of what student success should look like, with trusted data to predict outcomes or recommend courses of action. Obtaining favorable outcomes to student success initiatives requires a holistic view of the student that depends on access to a broad range of high quality student-centered data – historical and current, transactional and relational, structured and unstructured.

**Data analytics underpins student success initiatives**

For many institutions, student-centered data sets are spread across siloes such as registration and admissions, advising, financial aid, academics, student affairs, career services, and advancement. The student data is splintered, as it is more than likely stored in disparate, disconnected systems including SISs, LMSs, ERPs, spreadsheets and documents in file shares, web content management systems, social media services, and even video libraries. Bridging these traditional student-centered data siloes and adopting a holistic view of the student is necessary to reduce the risk when making strategic decisions and delivering a learning experience that meets the expectations and needs of students, administrators, staff, and advisors. For example:
Today’s students expect a seamless, unified experience with the institution by demanding instant access to their student transactions, activities, and performance, and to the services needed throughout their student lifecycle. The information is expected to be in one place, not spread across siloed systems or departments, as well easily accessible on any mobile device.

Administrators need greater visibility of student behavior and performance, from prospect to alumnus, in order make strategic decisions regarding programs and services.

Staff need a complete picture of the student to improve student satisfaction by being able to solve problems across the student lifecycle, from start to finish, in one place.

Advisors require data from across the campus for targeted messages and early detection of students at risk, to connect students with academic and social support when it is first needed.

Figure 4: Top higher education IT priorities over the next 18 months

The value and importance of having a holistic view of the student has led to a growth in predictive analytics. In North America alone, Ovum’s ICT Enterprise Insights 2017/18 – Global: Higher Education survey reports that 64% of institutions ranked analytics as one of their top three IT priorities, with 32% saying analytics is their number one priority over the next 18 months (see Figure 4).

Key to the growth in data analytics and business intelligence (BI) tools is that data analytics is not disruptive to current processes but evolutionary, providing the means to combine and aggregate siloed student data. Data analytics can have the quickest and biggest business impact for an institution by leveraging the investment in existing systems, as the technology supports turning complex data into actionable information that can be used to optimize teaching and learning, apply early interventions, drive efficiencies, and improve institutional performance.
Ovum's ICT Enterprise Insights 2017/18 – Global: Higher Education survey shows that institutions are focused on a more robust use of student-centered data, as tracking student learning and progress and tracking recruitment are the top areas in which deployment of data analytics is planned, at 27%. In addition, 24% of institutions reported tracking student support, tracking course performance, and tracking faculty performance as other key areas in which deployment of data analytics is planned (see Figure 5).

**Advanced analytics in a siloed infrastructure**

Higher education has volumes of student-centered data spread across multiple systems, stored in different and often incompatible formats. The challenge is to harness all this data to empower better decision making in support of both student outcomes and institutional performance. Emerging in the market are advanced data analytics tools that can plug directly into centralized data repositories fed by data in core student systems such as Tableau, IBM's Business Intelligence (Cognos), and SAP Lumira.

Institutions will derive the most value out of an advanced data analytics tool that supports and offers the following:

- **Interoperability, data standards, and compliance data standards.** For easier integration and rapid deployment, the centralized data repository should comply with common data standards for interoperability, access, and sharing of structured and unstructured data stored in existing systems across campus and with other
institutions. Data models or analytical content based on common data standards such as Common Education Data Standards (CEDS) in the US will decrease the time to translate data sets and remove the complexity of integrating digital content, data, and software.

- **Advanced APIs.** Advanced APIs will provide a 360-degree view of the student while reducing integration costs. APIs reduce the complexity and IT resources needed in linking large amounts of student data stored in the many disparate systems across campus, such as ERPs, SISs, financial aid, LMSs, customer relationship management (CRM), housing, social media, point of sale (POS), and parking. In addition, advanced APIs enable data sets to easily connect to preferred BI tools for analysis, visualization, streaming, and dashboards.

- **Cloud (software-as-a-service, or SaaS).** Cloud services are key to ensuring the flexibility and adaptability needed in today’s higher education environment. Data analytics solutions that are cloud-ready make it easier for institutions to deploy quickly, thus reducing the cost to procure hardware and the implementation time required for an on-premises solution. Data analytics tools that can be delivered via a SaaS model offer savings in their reduced infrastructure footprint, management, and maintenance.

- **Performance – timely analytics.** Delays in data availability can threaten the quality and accuracy of the data and the confidence of its stakeholders. To have the greatest impact on student success efforts and data-driven decisions, an advanced data analytics tool should be able to efficiently pull data from various systems and quickly return query results.

- **Privacy.** Critical to any data analytics tool is how it keeps the data safe and secure while protecting personal information. A critical component of any data analytics tool is the ability of the institution to govern the data, from who has access to which data to how the data can be used. In addition, the data analytics tool should easily enable the institution to comply with educational privacy legislation, such as the Family Educational Rights and Privacy Act (FERPA) in the US.

### Case Study – University of California, San Diego

**Bringing actionable data to reduce time to degree completion at University of California San Diego (UCSD)**

UCSD is recognized as one of the top research universities worldwide and has more than 36,000 students. It offers over 200 undergraduate and graduate degree programs and employs a staff and faculty of more than 30,000.

Even though UCSD has above-average rates of freshman retention and graduation, the institution wanted to improve time to degree completion due to state and federal funding now being tied to outcomes. With a traditional data warehouse and disparate legacy systems, UCSD needed a better way to curate student data for real-time access and accurate analysis. This led to UCSD collaborating
with the University of Kentucky and SAP to help design a new advanced data analytics solution to provide real-time insight into student behavior and success: the SAP Student Activity Hub.

The SAP Student Activity Hub curates data from existing SISs or any system deployed in the future. This advanced tool fulfilled the key requirements that UCSD’s IT department identified as critical to driving the university’s student success initiatives. First, the solution was cloud-based, meeting the institution's long-term technology strategy of shifting to a cloud environment. Second, it provided the option for the institution to keep separate data and not have to share data across the consortium. Third, the implementation of the solution was straightforward, since it used common data standards and leveraged existing analytics and visualization tools – Tableau and Cognos. Using CEDS, curated views were developed that were optimized for analysts.

After several months of beta testing, UCSD launched a formal rollout of the SAP Student Activity Hub in January 2018. Beta testing thus far has been positive, as the implementation with the CEDS curated views and advanced APIs for integration have been straightforward, without requiring significant resources. Hosted on Amazon Web Services (AWS), UCSD is delighted with the performance and speed of query execution. The institution is gaining deeper insights into teaching, student learning, and improving student outcomes, with the capability to deliver personalized intervention services where warranted. UCSD will be leveraging the SAP Student Activity Hub to provide actionable data that will support student engagement through the personalization of targeted messages delivered to mobile devices. Future plans call for the SAP Student Activity Hub to support artificial intelligence, machine learning, and chatbots for advanced student pattern matching and the delivery of more engaging services.

Improving student success with advanced data analytics tools

Analytics tools are key to institutions’ ability to compete

As institutions are competing for students and evaluating their administrative solution options, advanced data analytics tools empower them to leverage current technology investments and support the execution of student success initiatives.

Improving student success requires the ability to accurately identify patterns of student performance and behaviors from a breadth of student-centered data. With much of their transactional capability and student-centered data retained in departmental silos, institutions struggle to aggregate all of the data required to accurately inform student success efforts and improve operations.

There are two common approaches to addressing this issue: either a total transformation, where core administration systems are replaced by one of a few options of vendor solutions that offer comprehensive end-to-end offerings, or incrementally, with a best-of-breed strategy that replaces specific functions as priorities emerge. Both approaches are valid, and there is no one-size-fits-all strategy. Each institution will need to determine the optimal approach based upon its own unique requirements.

Advanced data analytics tools enable institutions to garner a deeper insight into student behavior and performance. These tools are key to an institution's viability in an increasingly competitive
environment. Deploying these modern tools enable leading institutions such as UCSD to reduce the risk of strategic decisions focused on the transformation of operations to drive student success and institutional growth, while enabling them to move to more modern administrative solutions at their own pace.

Given the competitive pressures faced by higher education today, institutions that wait or rely on administrative system replacement to improve their student success efforts will increase their risk of falling behind the competition and will face an uphill battle.

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.

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