



Accessing the right data at the right time

A letter from James Willey, senior vice president, product management, Ellucian

As a pioneer in advanced analytics for higher education, Ellucian believes that the ability to access the right data at the right time is essential to sound decision-making and strong institutional growth. With so many colleges and universities exploring options for enhancing their analytics capabilities, we are proud to sponsor Ovum's white paper, *Increasing Insights Across the Institution*.

In this white paper, you will gain insight into:

- **Current institutional attitudes** toward analytics and the role that effective leadership plays in successful adoption
- How new avenues to data-informed decision-making bring about **changes in business practices** that optimize efficiency and improve the campus experience
- How **effective campus leadership** can help navigate the change management issues that arise as colleges and universities evolve their operations

Breaking down data silos has been one of the most significant challenges facing higher education technology for a generation. The schools and various functions that comprise a modern campus have traditionally operated with a high degree of autonomy and independence—and that structure often leads them to see their data as departmental property, not an institutional asset. But given the interconnected nature of institutional governance today, the true value of advanced analytics is only realized when staff and administrators have access to information from across the institution.

Ellucian is excited to share our vision for the [flow of data and insights across schools, departments, and functions](#)—to wherever they are needed most to support smart policy. I hope this whitepaper clarifies both the value of advanced analytics in higher education, and the pathways to successful adoption.



James Willey

Increasing Insights Across the Institution

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Summary

Catalyst

The journey to successfully implementing data-driven decision-making in higher education is not without its trials and tribulations. Introducing analytics and the attendant changes to business practice, along with new insights that may challenge the status quo, will cause disruption throughout the institution.

In addition, the burgeoning market for standalone analytics tools prompts questions about the relative value of third-party tools and capabilities built into the enterprise suite.

Many institutions are seeking to implement or improve advanced analytics capability, and can benefit from lessons learned by leading players in higher education and other industries.

Ovum view

Success in implementing advanced analytics in higher education is significantly enabled by focusing concurrently on three areas: leadership, value, and platforms. Strong leadership and good governance are necessary to propel the shift to data-driven decision-making and operations, based on timely, reliable inputs. Without tightly integrated, user-friendly analytics platforms that simplify joining disparate data sets and provide easy-to-use visualization tools to provide insight, value is unlikely to be derived from even the most complete and timely data. Adhering, wherever possible, to common data standards, such as CEDS, can significantly ease the difficulty of gaining insights from data that spans several systems. Additionally, institutions should look to best practices from other schools' analytics journeys, as well as lessons learned from other industries, to increase adoption and benefits.

Key messages

- Improving analytics is a priority for most institutions.
- Clear strategy and effective change leadership accelerate the benefits of analytics.
- Value comes from having the right insight, in the right place, at the right time.
- Without the right technology platforms, institutions will be hard-pressed to succeed.
- Adopting best practices from higher education and other industries can significantly accelerate the benefits.

Leadership, value, and platforms are the keys to a successful analytics culture

Introduction

Higher education, along with many other industries, is finding the road to better use of data for operations and tactical and strategic decision-making to be difficult to travel. And what progress has been made has been more tactical than strategic – taking advantage of specific opportunities to propel a particular narrative, rather than a strategic advance toward achieving the overall institutional mission and vision.

In the analytics journey, there are many barriers to success, the most significant being lack of an overarching strategy, not only for analytics but for how data and technology will be employed to create

the university of the future. The implementation of a data-friendly organizational culture is also a considerable barrier.

There are three broad areas where focus is needed to promote success:

- Leadership – having a clear vision and strategy for the improved use of data to support the university; specific roles with defined responsibilities to implement (e.g., chief data officer, data stewards, data analysts); and effective strategies to implement change.
- Value – the capability to undertake analysis and present data to users in a meaningful form; at the right time; trusted to be fit-for-use; and backed by professional support when there is a specialist need.
- Platforms – having unified and integrated underlying technology, based on common data definitions, to undertake data-gathering, analysis, and visualization without friction.

Improving analytics is a priority for most institutions

Ovum's research shows that many colleges and universities still have a distance to go before they will be satisfied that their analytics capability meets their needs. According to Ovum's 2017/18 ICT Enterprise Insights survey (which targets over 400 higher education decision-makers across the globe to identify their technology needs and intentions), 66% of all higher education institutions envision expanding their analytics capabilities in the next 18 months. Analytics also rates first on the list of top-ranked IT projects, with 25% rating it as the highest priority, and 59% including it in their top three for 2018 IT project spending.

Recent Ovum research on tracking digital maturity across multiple industry sectors indicates that while the higher education sector is equaled only by the telecommunications industry in the maturity of its ability to take advantage of the value of data across the business, overall maturity is still poor. Only 27% of education respondents reported that they were well-advanced or complete with their initiatives, and 54% were in planning or early implementation stages.

Table 1: Progress with deploying analytics in higher education

Business function	Not considering	Considering, planning, or trialing	Deployed
Enrollment management	6%	60%	34%
Tracking finance and budgeting	8%	60%	32%
Monitoring human resources (HR)	8%	65%	27%
Tracking faculty performance	10%	64%	26%
Monitoring institutional performance	8%	67%	25%
Tracking course performance	9%	66%	25%
Tracking student learning and progress	7%	68%	25%
Tracking student support	8%	68%	24%
Tracking recruitment	7%	69%	24%
Alumni management	14%	67%	19%
Grand total	9%	66%	26%

Source: Ovum 2017/18 ICT Enterprise Insights: Higher Education (global)

The area with the least mature deployments in current practice is alumni management (19%, see Table 1). The strongest areas are enrollment management (34%) and finance (32%), with other functions hovering around 25% of institutions reporting that they have fully deployed capabilities. The area in which institutions are currently least interested in investing is that of alumni management, for which 14% of respondents reported they are not considering deploying analytics. Given that fundraising organizations in other sectors rely heavily on analytic insights to inform their target engagement, there would appear to be unrealized benefits available for higher education in this area.

Clear strategy and effective change leadership accelerate the benefits of analytics

Without a clear strategy, there will be limited benefits from analytics

The most significant barrier to success is not having an overarching "digital" strategy, not just for analytics, but for how data and technology will be employed to create the university of the future. Only 24% of US universities report having a well-advanced or complete digital strategy, and a further 31% are in progress (Table 2).

Higher education, as a sector, ranks favorably in having an overall "digital" strategy (37% overall maturity, see Table 2) compared with the other leading industries: utilities (39%) and telecommunications (37%), according to recent Ovum research into indicators of digital maturity. Education leads all sectors in the maturity of its exploitation of data across the enterprise (39%), with telecommunications (also 39%), banking, and utilities (both 37%) not far behind.

Table 2: Higher education digital maturity

Maturity factor	Not relevant	Not started	Early stages	In progress	Well advanced	Complete	Overall maturity (weighted average)
Digital strategy	7%	12%	25%	31%	16%	8%	37%
Use of data across the enterprise	9%	9%	23%	31%	18%	9%	39%

Source: Ovum 2017/18 ICT Enterprise Insights: Digital Maturity & Enabling Technologies (multi-sector, global)

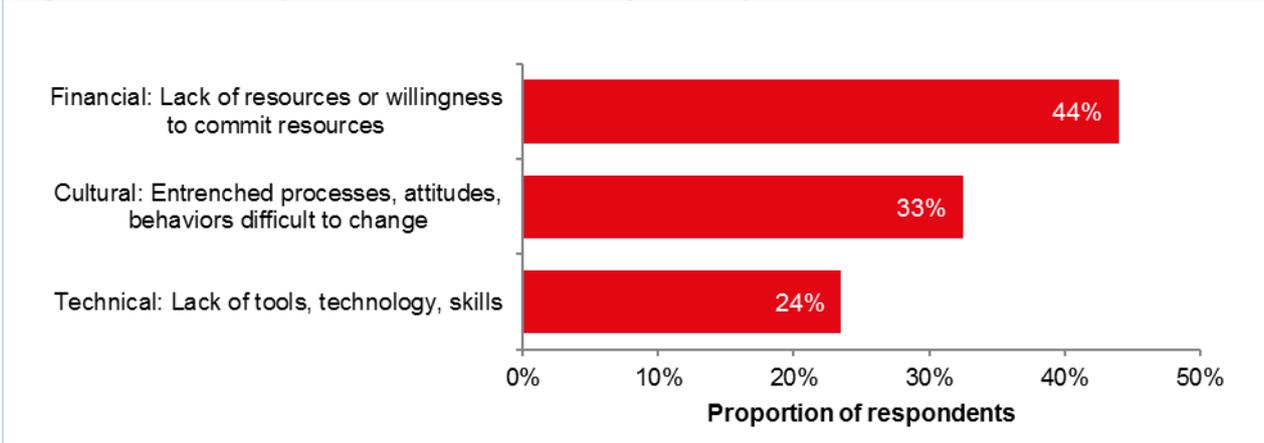
Within the sector, however, there is a significant breadth of maturity in the use of data across the organization: 18% report that they have not started, or do not intend to focus on analytics; 23% are in the early stages – totaling 41% of all US universities without an effective focus in this area. The largest group (49%) has analytics initiatives underway. The 9% of respondents who believe that better use of data across the organization is irrelevant to their institution's future success presents an interesting leadership challenge.

Insufficient investment can stall analytics

Ovum's 2018 Higher Education Analytics survey, which surveyed 200 C-Suite higher education executives in the US, found that there is a clear intention to continue to utilize data across most institutions, with 72% reporting that they will continue, or expand, their investment in analytics in the next budget period. 21% intend to invest at least twice as much.

However, financial constraints (lack of resources or willingness to commit resources) were still seen by respondents as the greatest impediment to analytics (44%, Figure 1).

Figure 1: Relative importance of barriers to analytics adoption

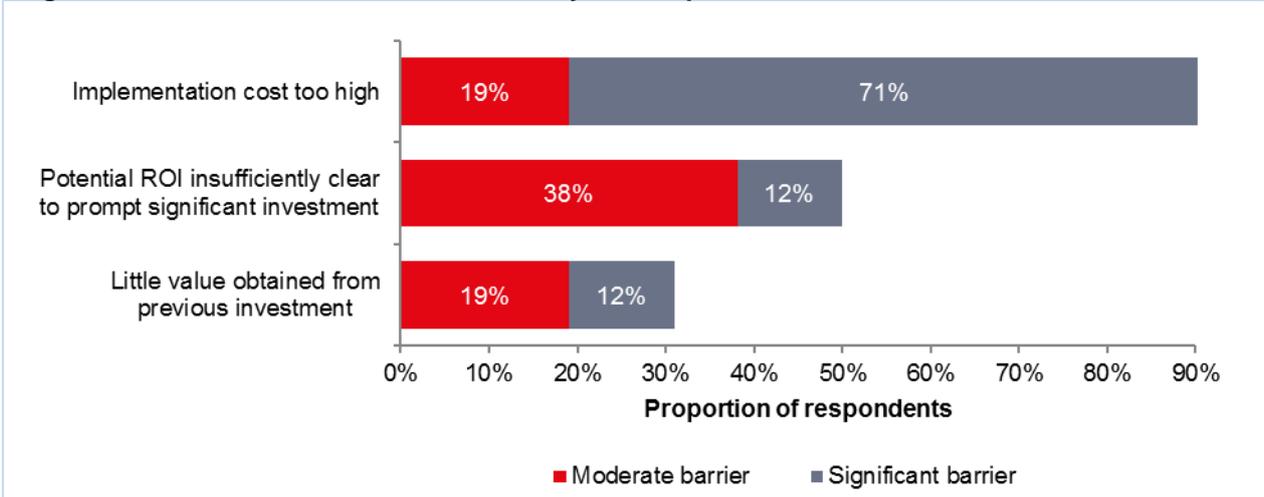


Source: Ovum Higher Education Analytics Survey, 2018

Cultural factors (entrenched processes, attitudes, behaviors difficult to change) rated second (33%) across all respondent groups. Most felt that technical factors (lack of tools, technology, skills) rated as the least significant barrier.

The main cause of the financial barriers was generally thought to be high implementation cost (90%, Figure 2), compared with 50% for likely future ROI, and 31% for value obtained from previous investment. Given these views, staged investment in analytics, with clear institutional-level ROI for each stage, would appear to be a prudent implementation strategy.

Figure 2: Cause of financial barriers to analytics adoption



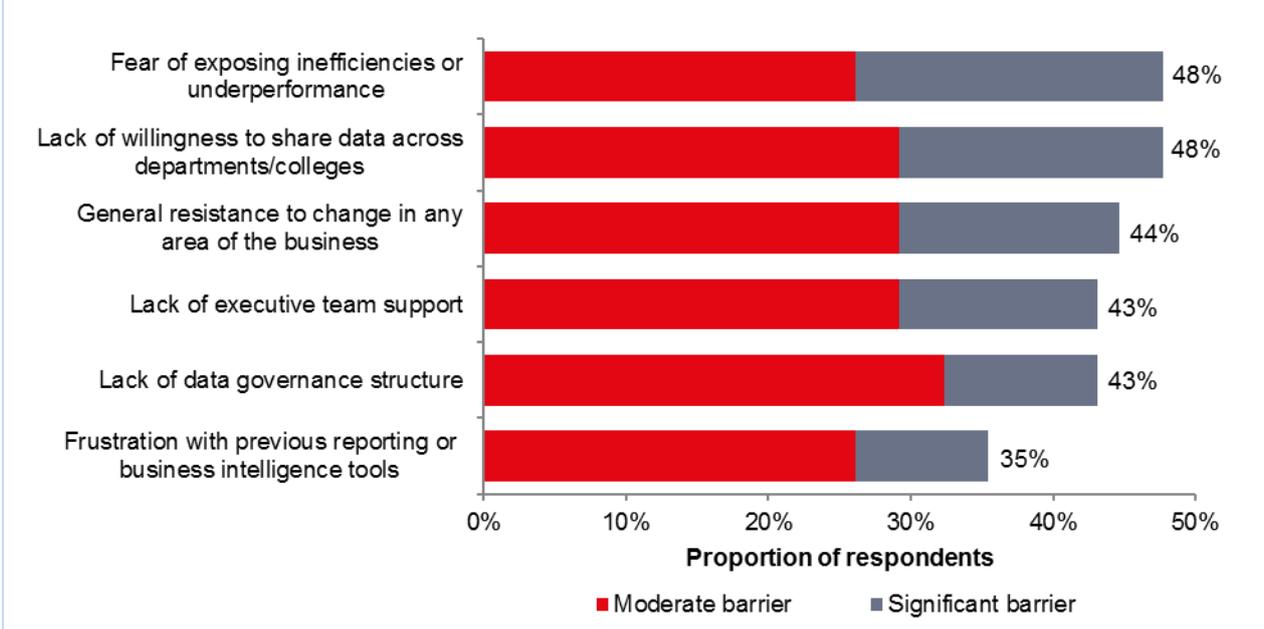
Source: Ovum Higher Education Analytics Survey, 2018

Evidence-based decision-making requires a culture shift

The implementation of a data-friendly organizational culture is a significant barrier across all industries. Education hovers around the median (39%), a 6% lag behind the industry leaders (45%). There are healthy signs for education, as plans are emerging for improvement, as indicated by 42% maturity for digital workplace strategies.

The greatest cultural barriers to adoption, by a small margin, are the fear of exposing inefficiencies or underperformance and lack of willingness to share data (both 48%, Figure 3). General resistance to change (44%), lack of executive support (43%), and lack of data governance (43%) were also nominated by a significant number of respondents as being barriers to change.

Figure 3: Cultural barriers to analytics adoption



Source: Ovum Higher Education Analytics Survey, 2018

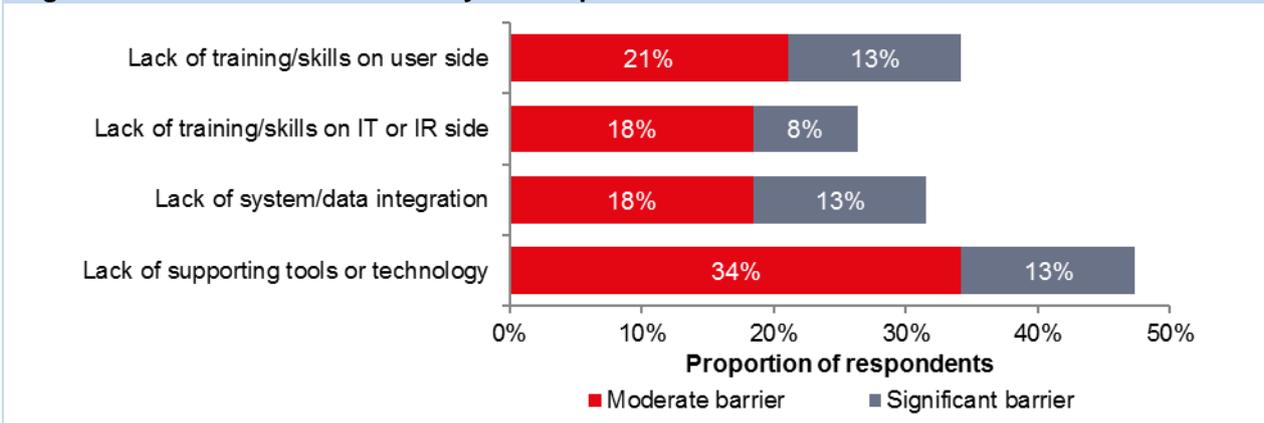
Respondents believed strongly that the loss of power or influence was the outstanding reason for an unwillingness to share data (44%), more than double the responses for any of the other potential reasons.

Put together, these reflect significant anxiety about the personal implications of greater use of data across the organization.

Technology and skills both need an update

Technology and tools issues were reported to be the most significant technical impediment to progress (47%), followed by end-user skills (34%).

Figure 4: Technical barriers to analytics adoption



Source: Ovum Higher Education Analytics Survey, 2018

Analytics is not just an extension of traditional business intelligence concerns

Traditionally, ownership for the institution's data capability has often resided with the group responsible for institutional reporting. While this is excellent for structured, transactional data warehouses, historical reporting, and ad hoc querying, it can pose issues when the university wants to move to using social, operational, and other new data sources, in near real time, as inputs to adaptive strategy and operations. Finding a way to continue to foster existing analytics while nurturing innovation in adjacent areas can present a significant leadership challenge.

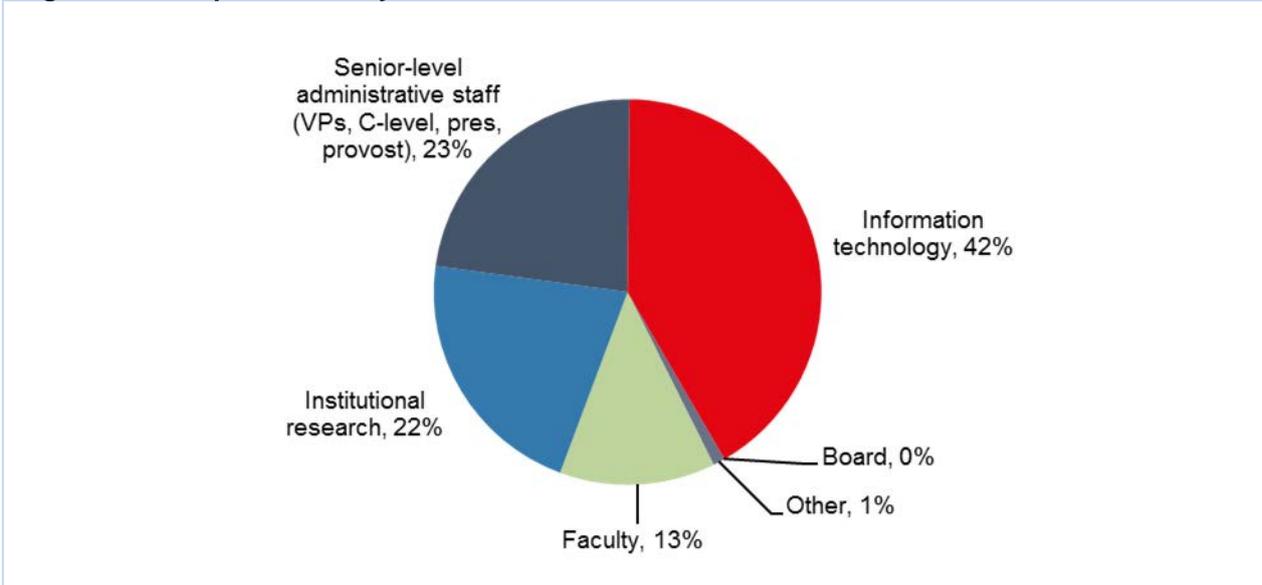
Those undertaking traditional institutional reporting are normally staff who have high numerical proficiency and are focused on the high levels of data quality required to generate accurate information. Providing more qualitative streams of data and insight on cohorts, or individuals, that is used to determine effective marketing, advising, or supporting action requires a different mind-set and skills, which fit more into the realm of data science.

Professionally, the two disciplines need to work together. However, structurally, there can be benefits in not having an emerging discipline constantly drawn into the busy traditional workload of the reporting and analysis team – particularly in the early stages.

Accelerating the breadth and depth of change with effective leadership

Even the best technology will not deliver value if it is not seen as both useful and usable. While big-bang delivery can be very successful, it requires a powerful sponsor who is prepared to invest time, as a priority, to inspire disparate groups to work together, or blaze a diplomatic path forward when difficult decisions emerge.

Figure 5: Champions of analytics



Source: Ovum Higher Education Analytics Survey, 2018

The adoption of enterprise-wide analytics is impossible without the strong stewardship of the institution's executive leadership. Indeed, most institutions that have embarked upon the analytics journey have reported that achieving implementation in an expeditious fashion, and even procuring the necessary funding and people, is a difficult task without enthusiasm from the executive leadership. Though their day-to-day responsibilities may not require a heavy interrogation of data via analytics, these executives need to take responsibility for serving as champions of the usage of analytics for its

potential to effect meaningful change within departments and improve the operational efficiency of the institution as a whole. In its analytics survey, Ovum found that when asked to name the biggest champion of analytics at an institution, 23% chose their executive leadership: a promising sign of growing executive awareness of the benefits analytics can deliver.

Taking a strategically incremental approach can be just as effective over the longer term. Within the context of a clear vision and overall strategy, opportunities are taken up where they arise and their success generates new prospects with stakeholders who are less inclined to be early adopters. An analytics implementation initiative would be well served by electing point people from each department or organization who can speak directly to the specific interests and needs of their group. A professor might want to increase engagement in an online course; an admissions officer might want to improve recruiting efforts; the advancement director might want a better way to target prospective donors. These go-to people could provide feedback, alert others within their department about training opportunities or updates, and serve as the "cheerleader" to raise awareness and excitement about how analytics can empower each department to function at a higher, more effective level.

Once overall momentum is building, establishing a center of excellence may be an effective tool to increase momentum as well as harmonize individual initiatives.

Proof-point initiatives that combine a new business problem and a new data source to provide actionable insight can be useful in moving staff from being reluctant to willing participants in change. Two example proof points are the use of social data in marketing analysis and Wi-Fi data to track student movements and densities in real time, on-campus, both of which can deliver a more personalized experience that can, for instance, increase student engagement and retention.

Taking an incremental approach allows time for related disciplines such as data governance, management, and security to mature, significantly reducing the risk profile associated with big-bang deployment. Delivering smaller and quicker benefit bundles also makes good sense in an environment where decreasing enrollment and increasing scrutiny around the value of higher education are prevalent.

Training resources, both online and face-to-face, are essential to ensure that all types of users can understand the data available to them, and be able to manipulate it to generate valuable insights. Peer-led training groups, for instance, are a useful device to deliver solution-specific training in the context of the institution, and even the use-case requirement being tackled. Applications vendors can also form partnerships with institutions to train data stewards to promote the correct use of their solutions and share best practices.

Active user communities contribute to both the rapid expansion of self-service analytics and the democratization of analytics across organizations. These can be supported by collaboration forums within the organization as well as leveraging those made available by the analytics vendor and the wider education analytics community. These communities not only facilitate problem-solving with the use of the tool, but also help newer users expand their understanding of how analytics can be leveraged for greater benefit in the education domain.

Value comes from having the right insight, in the right place, at the right time

To truly deliver value, institutions should consider and implement analytics solutions that put the user first. These analytics applications must offer intuitive UIs that let all users query data on their own terms and visual storytelling tools that encourage collaboration between different parts of the institution. Good analytics solutions can also integrate external data to generate deeper insights and easy-to-use data preparation tools to ensure users manipulate trustworthy data. Some forward-thinking vendors are designing analytics programs specifically around higher education roles, suggesting types of information that a person in that role would find helpful to their job.

An intuitive user interface enables effective data use

The user interface (UI) constitutes the proverbial "last mile" of analysis. For users, however, it is the first point of contact with the data. Traditional BI tools had complicated UIs, often involving complex coding and requiring specific training, making them impossible for nonexperts to use – leading to inflexible baked-in solutions. More modern tools combine powerful features with easy-to-use UIs, allowing most users to query, visualize, and present data.

Data presentation tools are critical to gaining value from analytics

Humans have immensely powerful visual processing capabilities, capable of drawing insights from shape, color, perspective, and motion as well as content. Matching the presentation of data to the context can improve comprehension as well as stimulating an appropriate response: for instance, gauges or warning lights on dashboards prompt action far more successfully than plain numbers. Surface charts provide a significantly easier means of locating peaks and troughs in performance than tables of values. For deep analysis, the ability to extract data for further processing is almost essential.

Integrating external data can provide greater illumination

The ability to bring data from outside the application's curated data set into the picture can enable additional insights. The imported data could be local to the organization, such as a Dean's Prize list, or public, such as a list of geotagged zip codes.

Vendors are increasingly delivering built-in automated data preparation tools, or data models, which help link and join data from disparate sources. Features of these tools include simplifying the process of creating "broad joins" with external sources: for instance, data that is not identified in exactly the same way as internal curated data (e.g., zip code vs. town name). This results in broader joins that lend more context to data and helps end users see a bigger picture than they would with point-to-point inner joins.

Collaboration tools to embed insights in the enterprise context

Insights are useless if they are not embedded in the enterprise context. Analytics vendors have addressed this issue by introducing and improving their collaboration and storytelling capabilities, enabling employees to create narratives with their data. To be truly insightful, collaboration must happen in context (as opposed to in general whiteboard or report-level discussions), allowing users to work together to comment and share results from within the analytics environment.

Even more important is that insight needs to be available in the midst of the action: students at risk need to be visible on the working screens of academics and support staff alike; specific risk factors should be displayed on the same screen as case notes for the advisor to easily incorporate them into future actions; past actions need to be correlated to changes in the student's risk profile.

Timeliness, traceability, and trust are critical to the value of data

As the breadth of data that factors into future business insights increases, so does the landscape of data quality management and governance. It is fortunate that much of the effort required to achieve high-quality, trustworthy data is the same as that required to be compliant with increasingly stringent legislation and standards.

For structured and unstructured data sources, ranging from spreadsheets to scraped-off social network comments, managing quality translates into understanding how the data has been filtered and otherwise modified as it moves from source to screen.

To help factor these quality factors, many of the newer tools come with watermarking and lineage features to help users and administrators establish where the data is coming from and how it has been transformed in the past. This is part of a broader set of data preparation tools that lets users easily transform their data, massaging it into an easily analyzable template. Lineage and data preparation tools are crucial in enabling AI (i.e., the automation of certain analyses), making sure algorithms can properly read reliable data.

Accepting that the various data elements contributing to business insights will come with different quality attributes is now par for the course. Data where the net benefit of the insight, however vague, exceeds the risks, is worth considering.

AI can reveal new insights, as well as delivering efficiencies

AI in the enterprise is about cutting down on the mundane, repetitive tasks that steal time from people who could use that time more productively by being creative, or making everyday decisions more effective with some data-driven insight either by "copiloting" for the user or taking action (within predefined limits) in the background. In both cases, AI is a function of automation.

To achieve these outcomes, AI requires access to data, ranging from small (familiar, transactional) to big (less structured and unfamiliar) in a computer-digestible format. Then, with powerful computational tools, it uses business context, constructed of rudimentary business rules, to make sense of the data being ingested and analyzed.

The benefit only accrues when its efforts are shared with the user in an easily digestible way, or pushed into the background through automating some task.

The concept of automating analytics is nothing new. However, enterprise-scale technology that can be applied to practical problems is just beginning to be widely available. There is good news here for the valuable people in your institution; AI is about making work easier, and hopefully smarter, and the benefit of that is time gained that can translate directly into additional productivity.

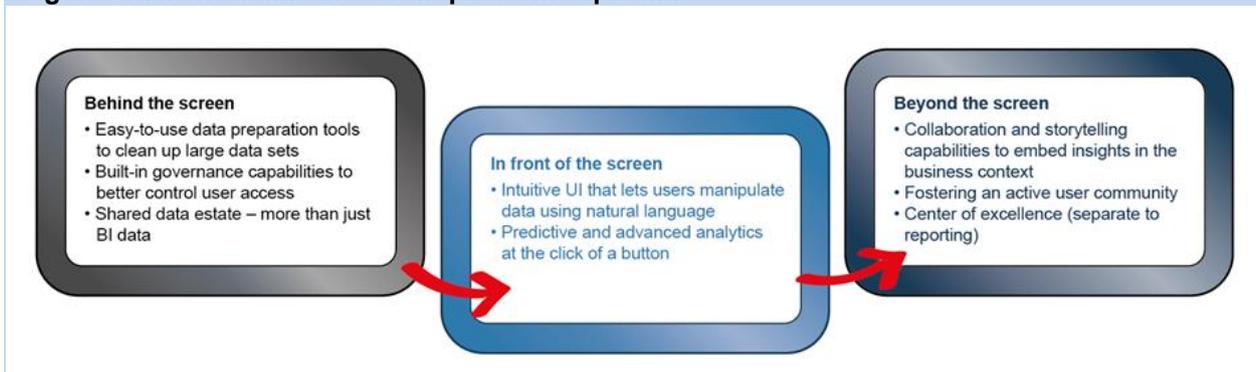
Without the right technology platforms, institutions will be hard-pressed to succeed

Many institutions still do not have the right technology platforms in place to support advanced analytics. Only 16% reported that they had data lakes or big data platforms deployed, though 54% were planning or trialing them.

Analytics technology is rapidly evolving, with new features emerging in three broad areas:

- Natural language search: being able to manipulate data using simple terms, with no coding skills necessary.
- User journey prediction: leveraging machine learning to suggest next steps to the user based on the data being handled.
- Predictive data representation: suggesting visualizations to the user based on the data being handled.

Figure 6: The front line in current platform capabilities



Source: Ovum

While these features are still at the leading edge, they indicate two key shifts:

- that the dominance of typed interaction and formally phrased queries may be on the wane, being replaced by spoken, natural language interactions and visual representations of results
- evolution from a retrospective, "reporting" mode in analytics to a prospective use of data to directly inform individual decisions.

Well-integrated, broad-based data provides superior insights

To offer value, advanced analytics needs to have access to comprehensive, high-quality data – historical and current, transactional and relational, structured and unstructured – to derive meaningful patterns and predict outcomes or to recommend courses of action.

For many institutions, data is splintered across multiple systems or departmental silos. It is maintained in SISs, ERPs, spreadsheets, and documents in file shares, web content management systems, social media services, and even video libraries. Institutions should consider this as an overall data estate and mandate effective data management practices for it, including a unified data model for the structured components. While implementation might comprise several technologies, it is worth thinking about the data and analysis tools as a *platform* capability for the organization – delivering institutional reporting and dashboards, and contributing to marketing, student success, and other insights.

Cloud-based analytics platforms will also mature considerably in the near future, helping institutions break down silos and integrate different elements of their technology stack. Vendors are currently positioning their analytics capabilities in the cloud to serve a range of needs, from those of the casual analytics user to the complex demands of the power user. Established and pure players alike have prioritized this development by bringing their different analytics, data management, data preparation, and governance point solutions into single cloud-based analytics offerings – and one leading higher

education vendor is moving its offering into production. With this approach, vendors are better positioned to serve a larger audience, using the flexibility of the cloud to deliver more functionalities while hiding the complexity of the interlocking solutions required to do so. The other main benefit of cloud-based platforms ties in with our earlier point about breaking down silos: APIs can be used to connect other applications to analytics clouds without major reworking of existing software.

Effective data management is critical if insights are to be trusted

Solid data management practices will need to be in place before substantial value can be gained from analytic platforms. Poor quality data, and data that cannot be accurately linked – for instance between systems where user profiles are maintained separately – both significantly reduce the value that can be gained from analytics.

Good data governance delivers more than just compliance

Governance is critical both for data quality and to ensure that data is used only for proper purposes and to reduce risk. Critical data is now being stored more extensively outside the SIS and ERP, which means that effective data management and governance needs to be applied wherever this data resides. In order for a university's data analytics implementation to succeed, the institution must create policies that address, for instance, what kinds of structured or unstructured data should be handled by whom, and ensure that this usage remains in compliance with HIPAA, FERPA, and other state and federal regulations.

Implementation requires cooperation across departments and users, and should mandate that only properly trained users can access and manage data relevant to their role. Effective data governance creates cross-departmental responsibility and accountability to ensure best practices and cross-enterprise sharing of data and insights.

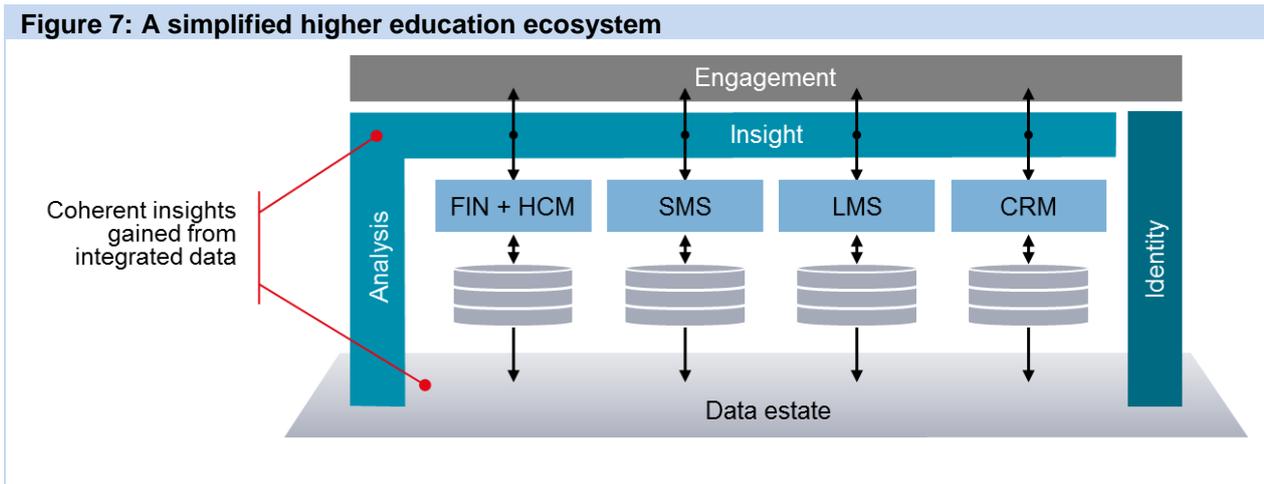
General Data Protection Regulation (GDPR) has flagged new levels of maturity and robustness for person-related data curation, which will include that collected and maintained for analytic and AI purposes. Even if explicit identifiers have been redacted, any data that could reasonably identify an individual will remain under scrutiny. Given that AI is a technology with enormous future potential for data matching, analysis, and insight, it can be expected that AI practices will be a focus for regulators in coming years.

Adhering to common data standards across the institution can improve the accuracy of data matching between repositories. Aligning with community-developed standards, such as the US Common Education Data Standards (CEDS) for data, provides a robust set of core data definitions, which can also be used for benchmarking between institutions and across the sector.

A challenge for institutions is in not *boiling the ocean*: avoiding applying high-overhead governance processes to low-value data. A risk-managed approach, allied with mandating the use of fundamentally secure data platforms, balances value and effort.

An integrated suite can provide a tailwind for analytics

Figure 7: A simplified higher education ecosystem



Source: Ovum

Where the institution has an integrated management suite, there is significant benefit in utilizing any built-in analytics capabilities, as the relationships between the data items, access rights, and visibility are usually baked in, simplifying implementation and data governance. The advantages of baked-in tools multiply with the breadth of the suite. The suite's integration capabilities can enable access to data from outside sources.

Adopting best practices from higher education and other industries can significantly accelerate the benefits

Driving research and insights at MD Anderson

The University of Texas MD Anderson, a cancer treatment center located in Austin, Texas, has long been heralded for its innovations in cancer research and treatment. However, the enterprise was suffering from a heavily siloed environment and customized analytics applications and tools. Such silos were leading to departmental inefficiencies and were resulting in competing intelligence from different sources. The staff found that much of their time was spent attempting to process and manage structured, unstructured, and semi-structured data across a variety of applications, rather than gleaning value from the insights such data could provide. Even worse, such issues were stymying the growth of the Moon Shots Program, MD Anderson's ambitious cancer prevention, diagnosis, and treatment initiative, which needed to bring together clinical, research, and genomic data from a variety of applications and sources.

To address these issues, MD Anderson's Clinical Analytics and Informatics (CAI) team developed a step-change analytics program called FIRE (Federated Information Reporting Environment), to improve the organization's underlying foundations and architecture and increase the impact of its analytics across the enterprise. This was a multimillion-dollar investment that sought to invest in new technology to create a new data architecture and improve the way in which data was managed and shared across the entire, extensive enterprise. Though the cost of this initiative was substantial, MD Anderson's

executive leadership, including the CIO and CMIO (chief medical information officer) and the IT staff, all recognized that a more integrated, consolidated approach to data analytics would lead to the insights needed to improve cancer research and patient care. As a result of such strong stewardship, and clear communication across the enterprise's different organizations, the FIRE team was able to receive the funds and support necessary to carry out the implementation.

MD Anderson went from a variety of analytics applications implemented in different departments to a consolidated approach. The FIRE platform now hosts all of the organization's operational, clinical, genomic, and research data, which is managed by a central IT team working with the enterprise's various departments. FIRE has improved MD Anderson's ability to optimize efficiencies, support R&D, and increase the level of services it can provide its patients. Pharmacy techs can now easily manage inventory and optimize their ability to locate and fulfill prescriptions. By standardizing terminology and data definitions across the entire enterprise, FIRE has reduced the time that researchers and admins spend on assembling data for analysis from weeks to minutes; this has freed up more time for them to spend on research and development. MD Anderson has also incorporated its unstructured data (such as doctors' notes on patient reactions to treatment) into FIRE, creating an algorithm to mine data for important medical nuances that can further improve patient care. The organization plans to further improve operations at the hospital by using insights gleaned from analytics to improve diagnostic and treatment plans and improve supply-chain management.

Increasing customer retention at a global telecommunications provider

A global telecommunications provider that is a major player in the prepaid wireless phone provider business was confronted with the problem of customer retention, a significant contributor to loss of revenue. While attrition is not uncommon in the highly competitive and heavily saturated telecommunications industry, this provider's challenge was exacerbated by the fact that the prepaid nature of its business means that it did not have access to the typical kinds of customer data that postpaid telecommunications operators do. This provider wanted to keep its customers longer by having a more in-depth understanding of the root causes behind customer turnover, and take a proactive approach toward retention.

The provider had several outdated and underutilized analytics systems, many of which had not been updated in some time. As a result, adoption and usage across the business of these analytics systems were very low. While a team of data analysts were employed to work on the problem of customer retention, their current solution – to manually compile diverse data sets and map out complex schema for various departments and brand managers – was an unscalable approach. Moreover, this process was so time-consuming that such data analysis was outdated by the time it was put in the hands of the relevant departments, thus rendering such insights obsolete and not resolving the problem of churn.

The provider knew that it needed a technology solution to automate parts of this process. Because many departments across the business would be using this system, ease of usage and self-service capabilities were also very important. It selected a new analytics system that allowed users to easily access, visualize, and mine various data sources across the organization (such as success of marketing campaigns, point-of-sale history, and subscriber usage) for insight.

The company is now able to bring together and analyze all of its customer and market data from a variety of sources in order to better track and understand the effectiveness of its marketing campaigns.

The time necessary to collect and analyze this data has gone from over a month to merely a few days; for example, the marketing department is now able to identify and proactively optimize opportunities to increase retention (for instance, creating better targeted promotions to appeal to these at-risk customers). The quick rate of adoption was facilitated by the platform's self-service capabilities; users were able to make use of the data and insights that made sense for their individual job requirements, without relying upon data scientists to carry out their tasks.

The company's increased ability to understand and reach its wide customer base has proved to have large quantitative benefits: within the first nine months, the provider has already recouped the initial cost of its investment. Part of the reason ROI is so high is because the company deployed the solution to a high number of users (120+ users) in a variety of departments. Ovum has found that such an ambitious strategy can have a multiplier effect on ROI, as each hour saved essentially creates an extra hour for users/departments that can be used for other activities. The company estimates that it will have \$1.3m/year in time savings alone, in addition to the \$2.7m/year it will see in increased sales. It also predicts that it will see \$17m in total benefits over the next five years, and will retain 1.1 million customers/year.

Achieving student centrality at Elon University

Elon University, a private, four-year liberal arts school in Elon, North Carolina, prides itself on its ability to help its 6,700 students achieve success within and beyond the institution. Its students wanted a way to demonstrate to prospective employers the ways in which their college experiences and coursework directly transfer to the professional workforce. In response, Elon created the Elon Experiences Transcript (EET), an initiative spearheaded by the Registrar's Office. The EET differs from the traditional university transcript in that it does not merely detail courses in which the student was enrolled and the grades he received, but instead is a more detailed demonstration of the skills and competencies the student acquired: school projects, volunteer experiences, extracurricular activities, and so on. Students can even embed project and presentation files, videos, and badges within their EET to exhibit the ways in which their college experience directly translates into career-focused outcomes.

To support the EET, Elon had to integrate systems to collate disparate data. As a result, the university can now access large amounts of data for analytics. Administrators, faculty, and staff now have a way to better understand the student population and improve the way in which they can create the services, programs, and skills that will increase student success.

Administrators are using this data to provide aid to the students most at risk, or to identify professors with the highest level of student engagement and learn more about their pedagogical approach and style. In addition, Elon is using data analytics to create a heatmap of Elon graduates across the globe to show the university's impact; this will be used as a recruiting tool for potential students. It will also be tracking whether adding in professional certification courses for under-enrolled seniors (who have already completed the necessary requirements for graduation) will increase their success in the job force. Having the ability to see the measurable results of new approaches and new models, and adapt them if necessary, is enabling Elon to deliver better end-to-end services for its students.

Cultural change management was a major issue for Elon as it moved into becoming an analytics-minded institution. Because analytics would be a new job tool for hundreds of employees across dozens of departments (and because technological change is often a fraught process), the university knew that coerced training and adoption would not be successful. Instead, Elon identified

and targeted power users from various departments, who were enthusiastic about using these systems and sharing the core benefits they could deliver. They found that as other users saw these results (such as sophisticated charts that delivered new insights into departmental roles), adoption increased rapidly and organically. While the Registrar's Office and Institutional Research team also worked with each department and even one-on-one with faculty members to train them on how to use the analytics systems, Elon also made sure to select systems that were user-friendly and visually appealing with self-service capabilities. As a result of this end-user-oriented strategy – that is, sharing how analytics would reduce employees' workloads and increase student-driven benefits – Elon has created an enthusiastic analytics community that is truly impacting student and constituent success.

Conclusion

While there are significant cultural, financial, and technical barriers to implementing institution-wide analytics initiatives that will bring solid returns on investment, none are insurmountable. Cost is a key factor in these challenging times, and incremental implementation of initiatives that generate specific benefits can be superior to big-bang implementation where learnings are applied in subsequent iterations. To follow this strategically incremental path successfully, a clear guiding vision and robust governance will help avoid missteps.

Data that is irrelevant, or considered insufficiently robust, for reporting purposes, such as social and operational technology data, can be valuable in generating new insights. The techniques for storing, managing, governing, and analyzing these new data inputs, and the mode of delivering insights to where they are needed, are quite different from institutional reporting. Consideration should therefore be given to developing a center of excellence with data science capability at its core, adjunct to institutional reporting, to spearhead and coordinate new analytics applications.

Finally, cultural factors and acceptance of the new way of doing things are critical contributors to success. Effective executive and local champions of change can significantly smooth the implementation path to success.

Appendix

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