snowflake®

7 WAYS EDUCATIONAL INSTITUTIONS GENERATE DATA-DRIVEN INSIGHTS WITH SNOWFLAKE

EDUCATION
SUCCESS GUIDE

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MODERN DATA ANALYTICS: THE CHANGE-MAKER

Education is facing new and evolving challenges and opportunities in the continuing wake of the global pandemic. A recent study revealed that one-third of private universities are at high risk, financially. In K-12 public schools, enrollment is down, absenteeism is up, and staffing is difficult.[1] However, educational pioneers are advancing new and innovative approaches to learning created in the early phases of the pandemic, making education more accessible and effective for years to come, a Harvard report reveals.[2]

To overcome the hurdles and leverage the opportunities, educational institutions must harness the power of data and modern analytics. In a joint statement, three major educational groups recently detailed the significance of data and analytics in boosting student and institutional success[3]:

Having access to nearly all your data, streamlined statistical analysis, and predictive and prescriptive models can enable institutions to make decisions on complex issues backed by constantly-evolving data insights. However, the practices of educational organizations' often lag behind current innovations. This tendency is nowhere more visible than in the field of data. Only a third of campus CIOs and CTOs in a 2022 Inside Higher Ed survey rated their technology investments in data analytics as "very" or "extremely" effective.[4] And a 2021 study of North American public universities highlights how existing educational data infrastructures that support learning management systems (LMSs) and customer relationship management (CRM) systems are outdated and disorganized.[5] It identified several areas in which institutions were lacking: a modern data infrastructure with centralized and unified data sources, data access and governance policies, and data integration and sharing capabilities.

Strategic educational leaders are harnessing the power of data to not just survive, but to thrive. They are modernizing their data platforms, improving their data collaboration capabilities, and deploying advanced analytics. In the process, they are improving student success and engagement, boosting operational efficiency, advancing research, and engaging alumni with more effective outcomes.

> **"We strongly believe that using data to better understand our students and our own operations paves the way to developing new, innovative approaches for improved student recruiting, better student outcomes, greater institutional efficiency and cost-containment, and much more. Data is an institutional strategic asset and should be used as such. The change-making capacity of analytics should compel institutions to harness the power of these new tools with a sense of obligation and responsibility."**
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> —The Joint Statement on Analytics from The Association for Institutional Research (AIR), EDUCAUSE, and the National Association of College and University Business Officers(NACUBO)

EDUCATORS: THE OPPORTUNITY AND ABILITY TO BECOME TRULY DATA-DRIVEN HAS ARRIVED

At Snowflake, we're leading the way to helping educational institutions and educational technology (edtech) companies mobilize data for data-driven decision-making. With the Snowflake Data Cloud, organizations can engage current and prospective students and improve student enrollment and success with insights from advanced analytics. They can drive operational efficiency across their organizations, from boosting faculty productivity to advancing research. They can develop strategies to engage alumni and accelerate fundraising. And they can reach institutional goals by unlocking value from previously siloed data with Snowflake's Secure Data Sharing and more than 1700 data listing on Snowflake Marketplace.

Snowflake empowers higher education institutions, K-12 schools, and edtech companies to achieve these benefits and more to help students get ahead, and to help their organizations move ahead. This ebook explores some of the innovative and exciting ways our customers in the field of education are already unlocking the value of data in an era of uncertainty.

#1 OPTIMIZE DATA PLATFORM MODERNIZATION

THE CHALLENGE

In a 2021 Association of Public and Land-Grant Universities (APLU) study, every institution surveyed said it struggled to use data to reach insights because of data silos in different computer systems spread across campus.[6] Several universities mentioned that users had trouble acquiring the level of access needed to run queries for their analyses, citing a lack of data governance. These barriers promote critical decision-making across an organization based more on gut than fact. Some universities have implemented conventional data warehouses and big data platforms, but they have not enabled the data collection and analysis needed to unlock previously unobtainable value from data. Faced with tight budgets, educational institutions must optimize their digital transformation projects to enhance teaching and learning and to manage their operations better. A modern cloud data platform can easily centralize internal and external data, handle an organization's most critical data workloads, and maximize data performance with near-unlimited scalability and concurrency to enable data-driven decision-making.

SNOWFLAKE'S SOLUTION

The Snowflake Data Cloud is a single, unified, cloud-built data platform that allows educational institutions to consolidate data warehouses, data marts, data lakes, and other repositories into a single source of truth thanks to Snowflake's multi-cluster shared data architecture. The Data Cloud enables advanced analytics and data science to deliver previously unobtainable insights to leaders in a timely, easy-to-use fashion. At the same time, it nearly eliminates system configuration costs, ongoing maintenance chores, and the continual tuning for performance improvements required of traditional solutions. The Data Cloud is a fully managed, as-a-service solution. It can easily load, integrate, and analyze all types of structured, semi-structured, and unstructured data inside a unified repository that operates within and across departments and schools, seamlessly. It also provides built-in features for maintaining and complying with national, regional, and industry-specific data governance, security, and privacy regulations and best practices. With the Snowflake Data Cloud, your IT and data professionals can shift their focus from managing a sprawl of disparate infrastructure to deriving actionable data insights for educators, administrators, and students.

CUSTOMER SPOTLIGHT

Auburn University, a public research university located in Auburn, Alabama, needed a next-generation data platform as part of its plan to implement effective data governance. Snowflake helped Auburn create a centralized data repository that enables timely data analysis and insights. Now, Auburn's leaders can access important statistics such as the total operating expense per full-time student and the percentage of students who are not re-enrolling after their first year to better determine investment areas. Advisors and professors can now better understand how to help students graduate successfully. The Snowflake Data Cloud also facilitates strong data governance, with a single source of truth that removes the costly and risky practice of duplicating data across multiple systems.

#2 ACCELERATE MODERN DATA SHARING AND COLLABORATION

THE CHALLENGE

Educational institutions rely on sharing student data to improve critical elements of education such as classroom instruction, student outcomes, and evaluations of program effectiveness. However, modern data sharing within and among schools remains a challenge. According to the 2022 EDUCAUSE Horizon Report, "Higher education stakeholders are not able to fully access the power of data to provide insights into student success until cross-institutional data sharing is facilitated."[7] The report recommends that institutions unify data sources internally first to "inspire broader efforts to integrate data and analyses across higher education institutions and other relevant data sources." Disparate systems prevent sharing data that could dramatically improve student outcomes and increase efficiencies in areas such as resource planning.

SNOWFLAKE'S SOLUTION

The Snowflake Data Cloud allows institutions to easily and securely share live and governed data across teams, departments, schools, and with 3rd-party organizations that comprise their extended ecosystem. Best of all, the data doesn't move. Using email, APIs, and other traditional methods of copying and moving what becomes stale data is a thing of the past with the Data Cloud. Schools can access data from various sources in various formats and unify it into a single, governed, scalable repository. All the while, data owners can retain total control of their data and can select data sets and attributes of the data they choose to share. With secure data sharing and collaboration, institutions can apply comprehensive analytics to optimize funding, improve learning, and enhance pathways to graduation.

CUSTOMER SPOTLIGHT

NYU

With the Snowflake Data Cloud, New York University leverages modern data sharing and analytics to boost student success. The school wanted to collect and analyze information about students and their interactions with faculty and assignments, but its learning management solution (LMS) was spread across many different systems. The LMS's management required many DBAs and developers, and data sharing and provisioning were cumbersome. By consolidating data in the Data Cloud, the school was able to collect and share data easily and quickly, without copying and moving data. Skilled resources are no longer required as the system is largely self-service. The school is now able to detect and intervene early with students who have missing assignments, or in classes where large groups of students have scored low grades.

#3 BOOST STUDENT ENGAGEMENT AND SUCCESS

THE CHALLENGE

Educational institutions are driving student success through the effective use of student-level data that can identify at-risk students and develop early-intervention programs. But that data is often stuck in disparate ERP/Student Information Systems, LMSs, and CRM systems throughout campus. Leading schools are freeing data from these systems to provide teachers and leaders with a 360-degree view of each student. Enabling Student 360 requires a modern data platform that can break down silos, ease data sharing, and facilitate advanced analytics such as machine learning and AI. But many schools are still struggling to effectively modernize and integrate their digital ecosystems. In a 2022 survey by The Consortium for School Network (CoSN), a professional association for school system technology leaders, members ranked their second biggest technology pain point as interoperability. "For operational efficiency and data accuracy, school systems need to work together seamlessly," the survey report states. "Major problems arise when they don't."[8]

SNOWFLAKE'S SOLUTION

With the Snowflake Data Cloud, administrators can access student data on past academic performance, attendance, and demographics from a central repository, giving them a full view of individual students or groups of students that can inform future decisions such as class selection, programming decisions, and investment areas. Are students completing their work? Are they leveraging provided district resources? Do significant achievement gaps exist among certain student groups? This single golden record can also be created for faculty and staff members, donors, or programs. In addition, schools can create self-service portals for students or professional community members that pull data from the Data Cloud. Snowflake provides a clean, data-rich environment that nearly any consumer of data across a campus or district can utilize through their own reporting and analytic solutions.

CUSTOMER SPOTLIGHT

The Los Angeles Unified School District (LAUSD) serves more than 600,000 students each year, representing 95 different languages and a wide range of socioeconomic backgrounds. During the pandemic's remote learning phase, LAUSD needed new ways to measure attendance, student engagement, and learning success. The school district used more than 45 digital learning tools to help students with remote learning and assessments. Leadership wanted to track student engagement—how well were students learning? When were they successful? How was remote learning failing? With the help of Snowflake, LAUSD was able to pull data from these tools into a central repository, analyze it, and use it to make strategic decisions. Administrators could see how long students were online across zip codes, campuses, and demographics. They could also drill down to individual students, and provide additional help, accordingly.

#4 ADVANCE UNIVERSITY RESEARCH

THE CHALLENGE

A major factor for success in university research projects is the ability to access and share information. Sharing research data promotes scientific progress by allowing others to replicate study results and the reuse of previous data for new research questions. But that data is often difficult to access and centralize for proper analysis. According to a recent paper by MIT, "the diversity of research methods, data practices, software, and computing practices across an institution can result in a complex network of locally controlled compute centers."[9] Issues also arise regarding the security and governance of the data as it is copied and moved in the data-sharing process.

SNOWFLAKE'S SOLUTION

Snowflake's Data Cloud enables higher education institutions to leverage data and analytics to improve and streamline their research operations and academic research. Universities often struggle to share data easily and securely in on-premises and cloud environments. Moving data to the Data Cloud eases the centralizing, governing, and sharing of data without the need for copying or moving it. "Data providers" provide "data consumers" access to live, read-only copies of the shared data and the consumers receive the providers' updates to the data almost immediately. Researchers can use the language or tools of their choice–Python, Java, or Scala–to build efficient pipelines, machine learning (ML) workflows, and data applications with **Snowpark**—the developer environment for Snowflake. The Data Cloud also allows them to easily access and integrate any of the 1700+ data sets available from Snowflake Marketplace* to enrich their internal data. Institutions that use Snowflake can advance novel medical discoveries, accelerate research and discovery, automate grant application and fulfillment, and build research knowledge graphs.

CUSTOMER SPOTLIGHT

pcori®

In 2014, the Patient-Centered Outcomes Research Institute (PCORI) funded PCORnet to create a national infrastructure for conducting clinical research, using electronic health data. The system facilitates data-driven research in an effort to achieve more effective and efficient patient outcomes. It integrates data from multiple health systems with Medicare and Medicaid claims, allowing investigators to compare clinical performance and financial data. With the Snowflake Data Cloud, the system is able to provide direct access to consistent financial information for procedures and encounters as well as medications and home health supplies. Snowflake's infrastructure supports direct querying across multiple enterprise data assets, eliminating the need to transfer files thanks to modern data sharing across health systems, federal agencies, and external laboratories.

#5 IMPROVE ALUMNI ENGAGEMENT AND FUNDRAISING

THE CHALLENGE

Many universities rely on their alumni to help support research and undergraduate and graduate education programs. For this reason, understanding alumni interaction trends and finding new ways to keep alumni connected are crucial to institutions. With easy access to modern data and analytics capabilities, alumni and fundraising offices can make better decisions and act more quickly with regard to donors and funding. However, once again, data barriers destroy the best of intentions. At a recent Institute of International Education (IIE) meeting, one of the top three challenges to comprehensive alumni engagement was that data restrictions create legal and infrastructural challenges: "Data integrity and IT security related to collecting, storing, and using information about alumni were presented as obstacles by all of the panelists. Organizations that have sub-units with different policies for data collection and storage have a particularly difficult time managing consistent communication."[10]

SNOWFLAKE'S SOLUTION

Snowflake's Data Cloud provides institutions with a secure, governed infrastructure that can enable real-time analytics, boosting alumni engagement and fundraising efforts. The Data Cloud can break down data barriers and collect structured, semi-structured, and unstructured data in a centralized location. Snowflake enables institutions to apply automated governance controls that improve data availability, integrity, and security. Institutions can then query the data with simple and advanced analytical methods, including data science and ML, and generate insights that were previously out of reach: Can we pinpoint certain groups of alumni that are more active with the school? What types of alumni become volunteers versus donors? Which alumni consistently open email communications and respond to phone calls? These insights can help schools make data-driven decisions regarding the creation and effectiveness of programs and fundraising strategies.

CUSTOMER SPOTLIGHT

UNIVERSITY OF NOTRE DAME

The University of Notre Dame chose Snowflake's Data Cloud to determine likely donors among its network of 135,000 alumni. The university built its first data warehouse with a legacy warehouse vendor. But the system couldn't scale to Notre Dame's thriving volume and velocity of data—a result of new, faster fundraising efforts. In addition, queries took 30–90 minutes to complete. These issues and other barriers stalled the university from delivering real-time business analytics. Notre Dame selected Snowflake and Tableau to create a secure centralized, governed location for all of its data that includes loading, integrating, and analyzing structured and semi-structured data with little effort. Notre Dame has achieved exponentially faster access to data and analytics reporting regardless of the volume, velocity, or variety of data. Notre Dame continues to be a leader in university fundraising. It is in the top 5% of all universities according to US News & World Report's Alumni Giving Rank. The university has improved its analytics performance 10-fold and now uses near real-time data to better target its fundraising strategies.

#6 DRIVE OPERATIONAL EFFICIENCY

THE CHALLENGE

While three-quarters of higher education CIOs use data to support student success, only 54% use data to improve internal processes, according to the 2022 Inside Higher Ed survey.[11] Schools are constantly looking to improve decision-making in areas such as human resources, finance, and student services. To do so, they must collect, centralize, and analyze data from multiple sources around campus. But, according to the EDUCAUSE report, "silos are a ubiquitous problem in higher education culture; they separate pockets of expertise, functional units, and individual personnel within institutions, making it harder than necessary to engage in institution-wide activities such as strategic planning…Data experts are urging higher education leaders to support significant cultural shifts and financial investments to unify institutional data sources."

SNOWFLAKE'S SOLUTION

With Snowflake's Data Cloud, universities can unify data from disjointed data stores into one secure, governed location and use it to achieve insights that will improve efficiency in operations. Snowflake provides a modern data infrastructure that lets institutions streamline inefficiency for core functions such as finance and human resources while gaining real-time visibility into administration and improving forecasting for future needs. The Data Cloud can help deliver granular and timely information across the campus, including how students are learning, how teachers and staff are performing, the progress of research, and the status of fundraising efforts. Different departments can also easily share data across these functions, and beyond, to reveal insights that were out of reach before modern data sharing was possible.

CUSTOMER SPOTLIGHT

THE UNIVERSITY of NEW ORLEANS

With the Snowflake Data Cloud, the University of New Orleans (UNO) democratized data across the campus while delivering efficiencies across its operations. The university planned to modernize its legacy finance, human resources, and student information systems to cloud solutions. There was valuable student and employee data in different locations and it wasn't well organized. Extracting student enrollment and departure data from the legacy ERP system for reporting was cumbersome, taking multiple programmers and many days of work. To turn that data into consumable information, the school needed to transfer it into a secure, governed location. Snowflake's Data Cloud immediately improved the university's analytics and reporting capabilities, giving analysts, researchers, and IT staff the ability to query data with analytics tools and get reports within hours instead of days. That's helping the UNO's Student Retention Committee understand the most effective strategies for encouraging students to continue their education. The capacity for greater analytics insights also helped UNO navigate the new rules for education during the COVID-19 pandemic, including minimizing risks to students' health and determining the pandemic's impact on enrollment and retention.

#7 POWER AI AND MACHINE LEARNING

THE CHALLENGE

Educational pioneers are harnessing advanced analytics such as AI, machine learning, and natural language processing to support students. According to EDUCAUSE, "machine learning gives researchers and practitioners new and immensely powerful tools to predict student success and intervene proactively rather than reactively."[12] And a recent McKinsey article credits data science and machine learning for unlocking "significant value for universities by ensuring resources are targeted toward the highest-impact opportunities to improve access for more students, as well as student engagement and satisfaction."[13] However, before higher education can benefit from these advanced technologies in the form of enriched decision-making capabilities, schools must improve their internal processes and resources for supporting, governing, and using those technologies.

SNOWFLAKE'S SOLUTION

Snowflake's Data Cloud was designed from the ground up to support machine learning and AI-driven data science applications. Organizations can build machine learning models easily using their language of choice with Snowpark—the developer environment inside of Snowflake. They can also harness near-infinite and near-instant computing resources to run data-intensive ML models and speed up ML workflows. Model results are near-instantly available in Snowflake for teams and applications to easily consume. In addition, organizations can connect Snowflake data to ML tools, with native connectors and robust integrations from a broad ecosystem of partner tools. With advanced analytics, customers can generate critical reports, uncover deep insights, make predictions, and recommend plans of action.

CUSTOMER SPOTLIGHT

Blackboard®

Blackboard provides educational technology solutions to higher learning and K-12 institutions. To provide data-driven insights that support client decision-making, Blackboard ingests and analyzes large amounts of user activity data generated within its solutions. Realizing the need for a modern data environment to handle and process the data, Blackboard turned to Snowflake's fully managed infrastructure to simplify data administration. Eliminating data infrastructure and engineering challenges frees up the capacity to develop a scalable data science function at Blackboard. Reducing administrative overhead has increased the company's capacity and flexibility to innovate. Snowflake's near-instant and elastic compute solved Blackboard's latency challenges and enabled ETL workloads to run up to 400 times faster than before. Despite investing more in its data infrastructure and expanding the software engineering team by 50%, Blackboard's productivity gains have far outweighed the costs. Snowflake represents about a 75% reduction in IT costs, and streamlining Blackboard's data pipeline with Snowflake makes data engineers at least 25% more productive.

UNLOCK THE POWER OF DATA IN EDUCATION

Leaders in the field of education are setting specific goals for digital transformation, and hope to make significant progress on them in the next three years, according to the 2022 Inside Higher Ed survey.[14] Snowflake's modern data infrastructure can deliver the results they seek. The Data Cloud enables educational institutions, school districts and organizations with modern data sharing and collaboration technologies to harness the potential of AI and machine learning. Other critical data workloads enabled by Snowflake include data engineering, cybersecurity, data applications, data warehouse, data lake, and Unistore. This power and flexibility enables educational institutions to improve student engagement and success rates. They are driving operational efficiencies and advancing research. They are engaging alumni and boosting fundraising. And they are utilizing advanced analytics and tools, with Snowflake's Data Cloud as a flexible and scalable foundation, to deliver superior services for students.

To learn how your educational institution or company can unlock the power of data with Snowflake, visit **Snowflake for Public Sector Analytics and Education Analytics**. To speak to a Snowflake representative about how the Data Cloud can advance your organization, contact Snowflake **here**.

ABOUT SNOWFLAKE

Snowflake enables every organization to mobilize their data with Snowflake's Data Cloud. Customers use the Data Cloud to unite siloed data, discover and securely share data, and execute diverse analytic workloads. Wherever data or users live, Snowflake delivers a single data experience that spans multiple clouds and geographies. Thousands of customers across many industries, including 543 of the 2022 Forbes Global 2000 (G2K) as of October 31, 2022, use Snowflake Data Cloud to power their businesses.

Learn more at **snowflake.com**

CITATIONS

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