EAB

Activating the Analytics Mandate

Why Higher Education Institutions Need a Data Management Platform

Education Data Hub

Authors

David Kuehl, Principal
Henry Inman, Associate Principal
Apoorva Shah, Principal

Contributing Consultants

Danielle Yardy, Associate Director
Jimmy Chiang, Vice President

Designers

Lauren Davis
Alyssa Dillon

Sources:

1) https://changewithanalytics.com/

Why Higher Education Institutions Need a Data Management Platform

Data and analytics are being used to address a wide variety of strategic priorities in higher education—from supporting student success, to monitoring enrollment KPIs, to maintaining financial sustainability, to enhancing teaching and learning. Moreover, because of its proven ability to drive positive change, data-enabled decision-making—or the "analytics mandate"—has risen to become a top priority itself at many institutions.

Yet despite the wide recognition of the importance of analytics, there seems to be a steady stream of publications from key stakeholders across the industry calling for increased action and investment. Most recently, the Association for Institutional Research (AIR), EDUCAUSE, and the National Association of College and University Business Officers (NACUBO) released a joint statement urging higher educational institutions to "reenergize" their efforts to use data and analytics to make better strategic decisions.[1]

Such a statement is certainly not the first of its kind and likely won't be the last. What is the disconnect? Why do so many current efforts and investments seem insufficient?

Most higher education institutions have made investments in various components of the analytics and decision support ecosystem—data warehouses, business intelligence (BI) tools, outside consultants. As we looked to understand why the benefits of these investments have not been fully realized, we gleaned key insights from outside industries that are more mature in their adoption of analytics. What our research found is that higher education is missing a key ingredient: a mechanism to store and source data from disparate systems, in one central location, under a governed data model. This type of solution can help institutions further realize the potential of analytics through the widespread democratization of data and insight.

> ▶ So what drives the need for such a solution?

▶ A Proliferating Ecosystem of Technology

Over the last decade, the advent of cloud-based technology has ushered in a massive expansion in the number of systems on campus that produce and consume data. In the past an institution may have had three to four limited and centralized core systems on campus. Today this number could be in the dozens if not hundreds (see figure 1). This results in an ecosystem that is not only siloed but much more complex than ever before.

The data that is consumed and produced by these systems still relates to the core building blocks of an institution—its students, its faculty, its colleges and departments, and so on. But now, to provide a 360° view of an individual student or program requires joining data elements across many systems and finding the correct data points and values.

Unfortunately, at most institutions, the growing pains of this data and system expansion are evident. Complex IT architectures, shadow storage, and a spider web of connections between systems make it almost impossible to find the signal in the midst of noise. At one major public university, this ecosystem consisted of 40+ databases, 600+ integrations, and a byzantine architecture that was impermeable to all but a few individuals at the institution. Sadly, this is not an exception but the norm at most higher education organizations.

In the past an institution may have had three to four limited and centralized core systems on campus. Today this number could be **in the dozens if not hundreds**.

Advent of Cloud Technology Has Led to Rapid Expansion of Systems on Campus

Figure 1

2009 LIMITED AND CENTRALIZED

Student Information System
Learning Management System
Enterprise Resource Planning

2019 EXTENSIVE AND SILOED

Student Information System
Learning Management System
Enterprise Resource Planning
Enrollment CRM
Application Hosting
Financial Aid Management
Conduct Management
Student Success Management
Learning Analytics
Faculty Management
Classroom Management
Hiring and Onboarding
Facilities Management
Student Engagement Applications
Degree Audit
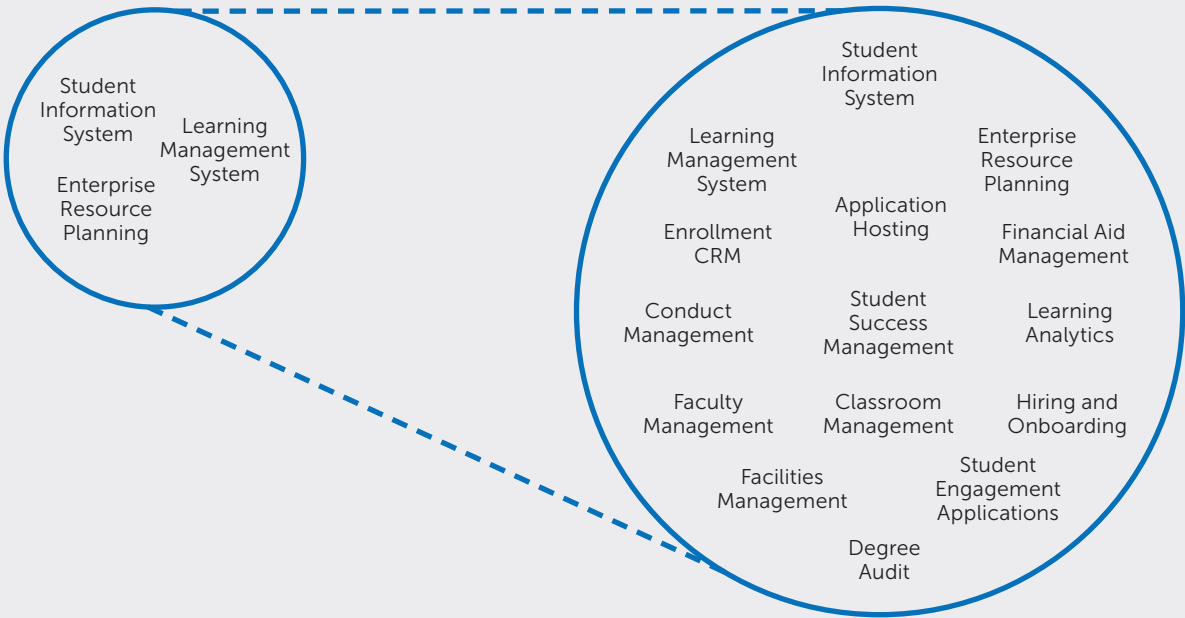
Increased Risk of Diminished Value to Existing Data Assets and Technology Investments

↑ DATA ❯ ↑ USERS ❯ ↑ QUESTIONS ❯ ↑ COMPLEXITY

▶ Key Barriers to Analytics Readiness

Three major barriers contribute to this byzantine architecture and prevent the analytics readiness that could enable individuals to fully utilize data for decision support.

BARRIER 1

Architecture by Accident

Growing digital demand, manifested through new technologies and applications on campus, has overwhelmed IT organizations with integration projects that require connections between disparate systems. However, for most institutions, this demand has not been supplemented with increased resources, leading to a large backlog of IT projects and underdeveloped integrations.

Faced with this reality, many CIOs are realizing that current approaches to data integration exacerbate problems and create a convoluted architecture where data is siloed and connections are brittle. This "architecture by accident" overlooks institutional value and optimizes speed to completion rather than truly investing in the data value (see figure 2).

"The number of new integrations we've built has **doubled every single year for four years**. We did 80 this year. Trying to scale what we're doing is **just not sustainable**."

Director of Enterprise Infrastructure
Large Public Research University

Developers Optimize for the Project at Hand

"Fast and cheap" mentality predominates to address growing backlog of projects

Integration staff working with siloed systems leverage different tools and protocols to build integration feeds

Focus on siloed data structures and systems limits viability of data for institution-wide decision-making

Resulting "Architecture by Accident" Cripples IT Innovation with Tack-on Systems, Shadow Storage, and Brittle Interdependencies

1

Higher risk of failure across increasing number of hand-coded integrations

2

Growing maintenance costs as the data and integration footprint expands

3

Decreased agility as disparate systems become more intricately dependent

Typical Integration Map
Figure 2
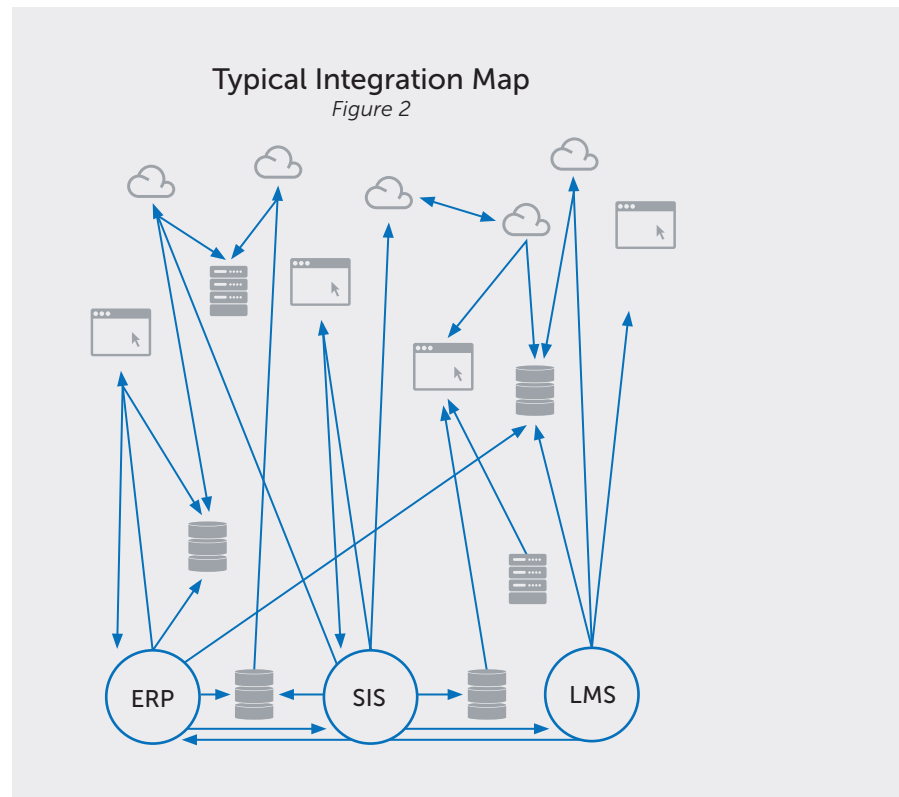
Although there are many integration tools that facilitate discrete data connections, these tools cannot provide the whole picture of data on campus and limit the ability for organizations to define strategic integration plans. The nature of data is fundamentally decentralized, so point-to-point integration patterns create negative economies of scale and approach limits of usefulness and maintainability as an institution's application footprint scales.

Without a solid foundation to enable efficient movement of data and a stable technology framework, campuses are unable to extract the full value from their technology investments and struggle to drive intelligent decision-making.

Key Challenges to Successful Data Governance
Figure 3

Data Definitions

- Varying definitions specific to each unit
- Data definitions for internal eyes only
- Staff only involved with data in their unit

Data Collection

- Data used for single unit purposes and value
- Placeholder data used for convenience of unit
- Data quality assumed and unverified by institution

Data Systems

- Static system aligned to business unit
- Inconsistencies among system implementation
- Siloed suboptimal shadow systems

- ✗ Multiple different definitions of "student" between departments
- ✗ Data definitions not publicly accessible or hidden unintentionally

- ✗ Workarounds use open fields to record advisor names
- ✗ Low adoption of central data and reporting tools, leading to data denial

- ✗ Excel spreadsheets stored on local analyst desktops
- ✗ Data errors only corrected in frozen data, not in source system

No Single Source of Truth

At its core, data governance is about making sense of data that is produced on campus and ensuring that its meaning is consistent as it moves around the organization. As described in figure 3, this has become an increasingly difficult technical and cultural task, given the expanding ecosystem of technologies and the growing demand for data to fuel strategic decision-making.

The way that data is managed at most institutions today confines its value to operational silos, prioritizing focus on department-level needs over institutional decision-making. As schools attempt to implement analytics initiatives, they're faced with several challenges—including inconsistent data definitions, poor data collection, and suboptimal systems architecture. Historically, units have had their own way of defining broadly applicable terms, such as "student" or "section fill rate," that make sense to a group's specific need but don't consider the broader need for consistency across campus.

Data governance can be an unwieldy, enterprise process—best-laid plans to "tackle" data issues once and for all are often overwhelmed by the magnitude of the project. A majority of institutions interviewed in EAB's research reported that their aspirations to resolve their data quality and access issues resulted in short-term enthusiasm and action, followed by a swift deceleration of progress, and ultimately a collapse of the process.

Despite the enormity of the task and the complexity of taking it on, getting data governance right is an imperative faced by all schools who want not just to better manage their growing ecosystem of technologies but to harness the collective power of campus-wide data to fuel analytic efforts and inform strategic decision-making that drives impactful results.

"We're currently in our third iteration of getting a data governance effort off the ground. When our last Provost left, so did the enthusiasm for the effort. That just can't be the case. Data is one of our most critical assets and must be a strategic priority."

CIO, *Regional Public University*

Limited Access to Data

Data users are clamoring for better access to data. This overburdens central decision support teams with basic data requests, crowding out strategic work. Central decision support teams estimate that anywhere from 25 to 100 percent of their capacity is dedicated to responding to ad hoc data requests, many of which are for basic institutional data such as enrollment figures. These requests come at significant opportunity cost (see figure 4).

Many institutions still struggle to provide their users with the data they need to improve their decision-making. Decision support teams are overburdened and fail to keep up with decision makers' needs and expectations. Institutional Research (IR) offices typically focus on meeting external reporting requirements rather than on conducting their namesake practice. Emerging business intelligence teams often struggle to identify campus members' needs and to deliver decision support from a central perspective.

With IR teams occupied fulfilling user requests and external reporting, no one on campus has the time to engage in strategic analyses. The process of retrieving data today is so onerous that most time is spent on descriptive (reactive) reporting rather than prescriptive (proactive). This further hampers schools in their attempt to activate their analytics in a manner that drives institution-wide innovation.

Significant Time and Money Expenditures from Ad Hoc Requests

Figure 4

$10,000
fully loaded cost
per ad hoc report

3,500
hours spent on ad hoc
reporting over 12 months
at one research university

3–6
week backlog for
typical unit-level
requests

A Solution to Address These Barriers Holistically

While most institutions tend to address each of these barriers individually, the reality is that they are deeply intertwined. A complex web of data integrations leads to poor data governance. Even solid data governance structures can't be hardwired in the institution's actual data ecosystem, leading to multiple versions of the truth. Lack of consistent data access leads to additional shadow systems and further complexity in data integration. The list goes on.

What is needed is a solution that holistically addresses these challenges. One such solution that has already been used by outside industries for years and can be well leveraged in higher education is a Data Management Platform (DMP). The digital marketing industry, for example, has used DMPs to collect and manage disparate consumer data from multiple sources and create a unified 360° view of their customers. DMPs have enabled companies to gain a better knowledge of their market and target specific customers who are likely to purchase their product or service. Data Management Platforms were needed in digital marketing because data on consumers came from so many different sources and systems. Replace the word "consumer" with "student" or "faculty" and the need is analogous to higher education.
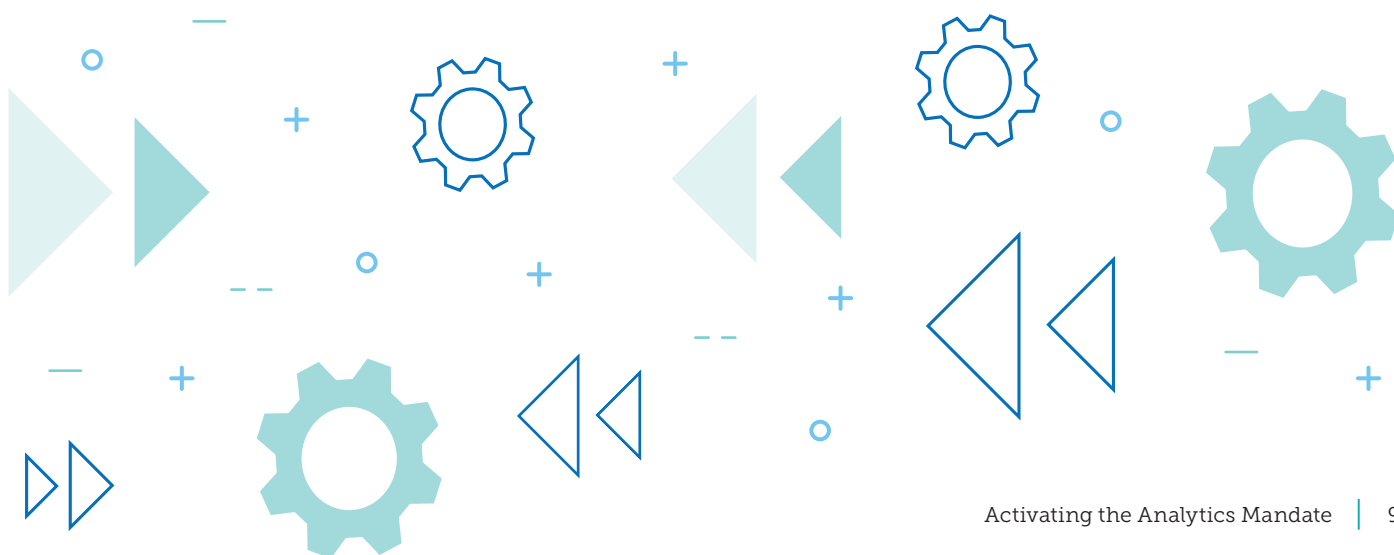
▶ What Is a Data Management Platform (DMP)?

A DMP is a centralized framework for unifying and staging data according to common business use case definitions and making that data available to integrate into other systems or BI solutions. There are three defining characteristics of a DMP. A DMP must be open-purpose, vendor-agnostic, and future-proof (see figure 5).

Open-Purpose

Instead of requiring source system experts to enable access, the DMP democratizes data through an industry-specific data model that makes it available using real-life definitions, not those of source system tables. It also improves data security by all but eliminating the need for shadow systems. Data stakeholders can now get access to the information they need, whether directly from the DMP or via another application, such as a BI tool, while resting assured that data will stay out of the hands of those who don't need it.

Vendor-Agnostic

While many source system vendors provide their own solutions to aggregate data, organizations need a flexible solution that enables an open architecture demanded by modern cloud applications. The number and types of technologies are increasing exponentially. Successful data management is not about constraining that growth or enforcing arbitrary limitations but rather providing a flexible framework that evolves with the needs of the organization.
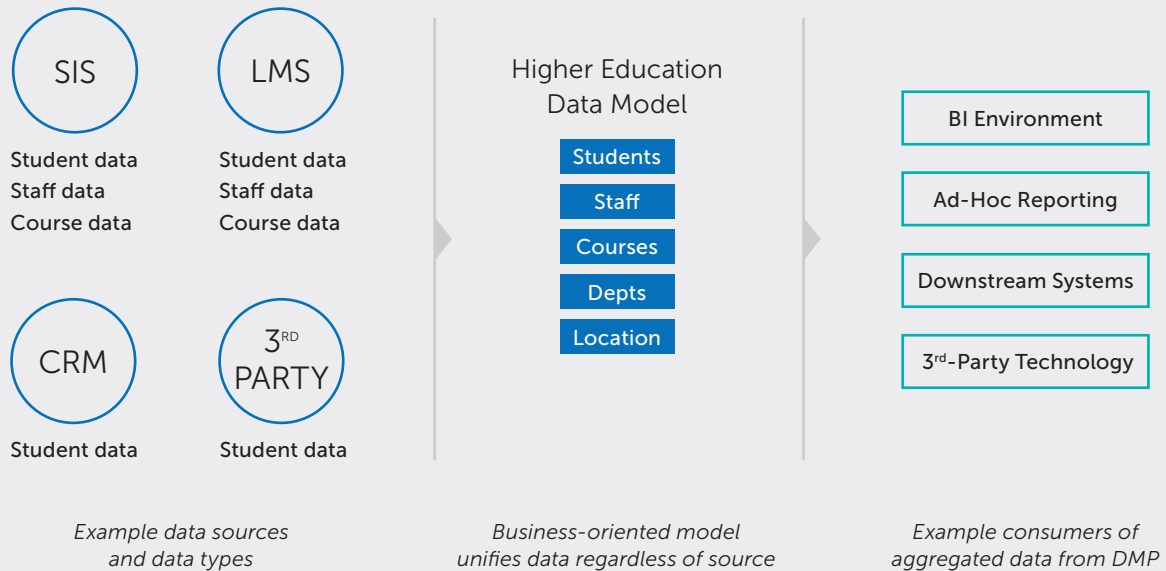
Future-Proof

Indeed, organizational needs will undoubtedly evolve. New use cases, new users—all these things will require organizations to remain agile and value data as one of their most critical assets. This means that the DMP cannot remain static. It must allow for and facilitate change. Whether a move to a new cloud-based ERP or the adoption of a new mobile application, the DMP can minimize disruption, accelerate sustainable innovation, and enable organizations to fully activate their analytics mandate.

A DMP accelerates value, making the whole (the total value of technology investments) greater than the sum of its parts (the value of each individual technology or system).

Example Framework for a Higher Education Data Management Platform
Figure 5

SIS

Student data
Staff data
Course data

LMS

Student data
Staff data
Course data

CRM

Student data

3RD
PARTY

Student data

Higher Education Data Model

Students

Staff

Courses

Depts

Location

BI Environment

Ad-Hoc Reporting

Downstream Systems

3rd-Party Technology

Example data sources and data types

Business-oriented model unifies data regardless of source

Example consumers of aggregated data from DMP

EAB believes that data management platforms should and will become the norm at most higher education institutions over the next decade. While some organizations will choose to develop a DMP themselves (and indeed several already have), others will want a partner to accelerate implementation and adoption and have access to additional support.

Regardless of the path chosen, campuses cannot afford to wait in making a purposeful investment in data management. In an increasingly competitive and uncertain education environment, competitive advantage will be held by those who optimize the use of data and overcome all the barriers that have been thwarting full data value so far.

EAB is eager to serve the industry on this journey, enabling the practice of successful data management and supporting organizations as they look to implement their own data management platforms.

About the Education Data Hub

The Education Data Hub is a data management platform that centrally organizes siloed data sources from the growing ecosystem of technologies on campus into a single, system, and vendor-agnostic data model. Institutions are leveraging the Education Data Hub to scale integration efforts and reduce IT operational burden, while also enabling data-informed decision-making with ready-made access to a single, aggregated source of campus-wide data.

▶ **Learn more at eab.com/EDH**