

# Creating Reusable Data Services For Campus

Finding Common Integration Needs to Capture IT Efficiencies with Reusable Data Services

## Study in Brief

This report profiles practices and methodologies employed at universities and colleges that have successfully initiated efforts to consolidate their point-to-point integrations to provide enterprise-wide data services for their campuses, capturing benefits including better data quality, faster software onboarding, and data capability enhancements.

## 10 Ways to Use This Research

- Building an enterprise integration strategy
- Designing an institutional middleware end state
- Engaging stakeholders in campus integration strategy efforts
- Developing surveys to understand campus data usage and movement
- Conducting interviews to audit campus systems and data storage
- Implementing master data management policies and practices
- Defining integration as a campus service
- Assessing enterprise data needs
- Onboarding new unit-based technologies to support enterprise-wide needs
- Allocating IT innovation funding to incoming technology projects

# Chaotic Architecture Crippling Campus Innovation

## How Can IT Escape the Growing Burden of Integration and Improve Agility?

The explosion of technology use across different areas of campus means institutional data is now constantly in motion. As new applications are added or new analytics requests are made, implementation teams work to feed them with the information they need from long-standing systems of record like the SIS and ERP. At most campuses, this means building a use-case specific integration that pulls the required data and sends it to a new location in the format desired. However, as the number of applications and data requirements increase, the requirement for integrations increases exponentially.

By continuing to invest in point-to-point infrastructure, campuses are building dense spider webs of data movement. These expose institutions to a diverse array of risks that loom larger with every new integration, including:



**Higher costs** for maintenance and updates



**Increased risk** of failure across artisanal code



**Reduced accuracy** of institutional data efforts



**Limited ability to scale** different siloed technologies



**Increased complexity** of data audits for compliance



**Greater vendor lock-in** when optioning new systems

Appetite for technology and data shows no signs of abating, but extending the use of point-to-point integration is limiting institutions' ability to embrace their technology and the data they amass for innovation. To keep up with demand and retain tighter awareness of institutional data movement, IT must find more efficient ways to deliver accurate information across the growing technology ecosystem.

### Each New Point-to-Point Solution Increases Campus Technical Debt



Point-to-point, to me, means no real supporting infrastructure. The more point-to-point you do, the bigger hole you're digging for yourself. That's a lot of rework for a lot of people. While they continue to do this, they just keep making the problem worse."

Harry Samuels, Associate Director,  
Enabling Technologies  
Northwestern University

# Campus Idiosyncrasies Limit Optimization Potential

## Poor Visibility and Siloed Priorities Thwart Enterprise-Level Integration Efforts

Beyond establishing data feeds for new systems when requested, CIOs and their teams often have limited awareness of the ways that business units use technology and data. While CIOs know that much of the same data is used by different groups across campus, lack of visibility into existing data movement, partnered with a narrower project-level analysis for new integrations, prevents the creation of cross-campus services. IT teams are trapped in a cycle of adding evermore point-to-point integrations to the campus portfolio to meet the immediate needs of the most vocal (or best financed) campus units.

### Collateral Damage: Siloed Efficiencies Limit Campus-Wide Integration Reform



#### Poor Visibility into Campus Data Needs and Usage

Once campus units are up and running with their direct ETLs or flat files, IT organizations retain little insight into the ways data and technology are used to support siloed operations. This makes it difficult to identify opportunities to scale IT's data services. IT's visibility into campus usage rarely stretches to cover ad-hoc user efforts, including:

- How the idiosyncratic workflows of faculty and administrative staff augment, cleanse, or repurpose the data they are using once it is delivered
- Where manual processes facilitate 'integration' by inputting data between interfaces for separate technologies
- Whether feeds that are still supported by IT remain in use by distributed units, or are supported within IT but dormant for users



#### Limited Consumption of Enterprise Data Object Services

Because units optimize data for their purposes within siloes, the enrichment of campus data at the enterprise level is often overlooked by data and process owners and IT project sponsors across the institution. Stakeholders' disinterest in supporting scalable integration opportunities is reinforced by their unit-level priorities, which include:

- Maintaining entrenched interpretations of "data ownership," leaving units unwilling to share data or compromise on their own data object definitions
- Limiting disruption to business-as-usual, including unwillingness to modify existing business processes to embrace new technology standards
- Reducing upfront integration costs during IT projects, emphasizing "fast and cheap" efforts to meet their particular needs



#### Not Just a Stakeholder Issue

While stakeholder engagement is a key factor in institutions' inability to transform their integration practices, for many there are changes to be made in the culture, processes, and tools internal to IT.

For tactics and toolkits to overcome project-focused mentalities *within* the IT organization, access the IT Forum's executive brief [\*\*\*Equipping IT for Integration at Scale\*\*\*](#).

# Consolidate Data Feeds to Improve Return on Integration

## Reusable Data and Integrations Maximize IT Investment Value, Improve Agility

Overhauling campus integration architecture is a long-term project, but CIOs and their teams can make incremental progress by focusing their efforts on consolidating services to deliver the most widely-used, replicable enterprise data to campus in more efficient ways. With an identified, loosely-coupled end state in sight, IT teams should work with business leaders and — where appropriate — distributed IT staff to map campus data in motion and invest in integrations to scale shared data objects uniformly.

### To Move to More Reusable Data Integration Services...

*Have You Promoted Reusable Data Services on Your Campus?*

**Enterprise Data Objects**

ERP      SIS      LMS

- An enterprise systems architecture that promotes integration reusability should:
- Reduce manual workloads for data transformation and loading
- Focus on loosely coupling back-end systems to front-end applications
- Prioritize central data reuse over siloed data proliferation and point-to-point data dumps
- Invest in common business logic and service definition across siloes
- Standardize identity and access management rights across the organization’s data and application suite

### ... CIOs Must Work Closely With Campus to Identify and Capitalize on Shared Data Assets



#### Uncover Existing Data and Integration Usage

To begin the process of rationalizing campus integrations, CIOs and their teams must first work to understand the architecture currently in place. For many campuses, this means working closely with stakeholders and end users to document current practices and data movements to isolate opportunities for consolidation and shared services.



#### Maximize the Uptake of Enterprise-Level Data Assets

To leverage centralized data assets at scale, IT must look to create objects with the most wide-reaching applicability, and ensure pervasive end-user adoption. Ongoing work must continually expand the number and types of data available at the enterprise level, ensuring user-friendly access and comprehensive utility for each new domain.

Source: EAB interviews and analysis.

# Looking for Frontier Practice

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— “ —  
*How are CIOs consolidating integrations to maximize their value?”*

CIOs asked the Forum to find promising, replicable approaches to consolidate data extracts and feeds to maximize IT return on integration. From more than 100 interviews with CIOs, four scalable strategies emerged.

This study is based on understanding gained from diverse higher education IT leaders. We are grateful to interviewees for sharing institutional insights and benchmarking practice. We have abstracted the institutional insights to make them more generalizable for colleges and universities with different missions and budgets, but the Forum’s work is, as ever, grounded in the proven innovations of progressive practitioners.

## Featured Institutions—With Sincere Appreciation

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**Northwestern University**

Sean Reynolds  
VP for IT and CIO

Harry Samuels  
Associate Director, Enabling Technologies



**Newcastle University**

John Donaldson  
Integration Services Manager

Janet Wheeler  
Former Lead, IDMAPS Project



**Berkeley**  
UNIVERSITY OF CALIFORNIA

Bill Hall  
Chief Technology Officer

Tom Tsai  
Senior Manager, Architecture Platforms and Integration



Kelly Flanagan  
VP for IT and CIO

Phil Windley  
Enterprise Architect

## Selected Research Participants

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### University of Chicago

Mike Fary  
Senior Consultant, IT Strategy

### University of Connecticut

Michael Mundrane  
CIO and VP for IT

### Eastern Mennonite University

Ben Beachy  
Director of Information Systems

### Vassar College

Beth Hayes  
Deputy CIO

### Syracuse University

Kathy Kinney  
Director, Enterprise Process Support

### Oregon State University

Lois Brooks  
CIO

# What the Best Are Doing

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Increasing the reusability of integrations on campus demands that IT focus simultaneously on existing integration needs and the creation of new data services with wide applicability. To maximize campus value from integrations, the best IT units are partnering with end users to understand the intricacy of unit data needs, while investing in reusable integration services that deliver standardized high-use data at scale.

## *Understanding End Users' Shared Data and Integration Needs*

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### **Campus Needs Data Survey**

*Engaging Distributed IT to Prioritize Enterprise Data Requirements*

Enterprise architecture committees or other architecture governance bodies poll distributed IT professionals to identify data used in multiple applications across campus. These shared data elements are the best opportunities for investment in reusable integrations. As new projects launch on campus that involve key data components, additional upfront spend supports data exposure and API development.



### **Two-Step, Face-to-Face Integration Mapping**

*Gaining Visibility into Unit Data Use to Build a Clear Picture of Campus Data Movement*

IT works closely with data users to document existing data flows in a two-step interview and edit process. Developers collect detailed information on data use from end users and stakeholders to create data flow diagrams for review. Stakeholders then review the diagrams and confirm or edit them, ensuring that all data augmentation or processing undergone in units is effectively captured.

## *Increasing Consumption of Standardized Enterprise Data and Integrations*

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### **Iterative Enterprise Data Rollout**

*Increasing Uptake of Centralized Data Services Through Inclusive Communications*

CIOs or enterprise technology directors begin the process of introducing new enterprise data objects (EDOs) six months prior to their rollout on campus. This generous timeline is publicized through multiple channels. It provides a structured process for campus to suggest revisions to the EDOs, and for implementation of changes, prior to the transition. Giving users time to adapt significantly improves uptake at launch and lowers dissent once new objects are live.



### **Consolidated Campus Data Access Point**

*Leveraging Ongoing IT Projects to Build a User-Friendly, One-Stop Data Service*

High-use enterprise data domains are consistently exposed to systems and users across the institution through one central access point (e.g., an API). User access is federated using a single unique identification key per individual or system. Consolidating high-use data services into one API improves uptake by streamlining data access processes and improving user experience. Where appropriate data is not yet available through a central access point, any new projects are evaluated for their capacity to provide it, and assigned extra implementation funding to make enterprise data available in the one-stop API.

# Campus Data Needs Survey



## Engaging Distributed IT to Prioritize Enterprise Data Requirements

### Practice in Brief

CIOs and Directors of Enterprise Technologies poll distributed IT professionals to identify critical data for campus and use those data to prioritize opportunities for investment in reusable integrations. As new projects launch on campus that involve key data components, additional upfront spend supports further API development.

### Implementation Steps

- Identify the appropriate body (e.g., Service Oriented Architecture Adoption Committee, Enterprise Architecture Governance Committee) to conduct a survey of distributed IT.
- Empower the selected surveyors to develop questions that gather information about unmet data needs and seek to surface challenges related to accessing data in the current environment. Supplement survey responses with targeted focus groups to successfully identify campus priorities:
  - Send the data usage/needs survey to distributed IT managers
  - Include questions about known data priorities (e.g., demographics and identity, employment, academics)
  - Use the survey to seed questions in the subsequent focus groups
  - Show survey responses to campus to build leadership support for investment in reusable integrations
- Analyze upcoming projects to see which require integrations with data prioritized in the survey. Based on these criteria, select an appropriate project to begin building reusable integrations.
- Develop reusable integrations for the selected projects with funds from the project owner or central IT during the already scheduled project work.

### Benefits to Institution

- › Decreased implementation time in future projects
- › Increased accuracy of institutional data
- › Reduced downstream costs for integration maintenance and upgrades



While the results of our survey on campus data needs weren't surprising, they did give us the push we needed to invest in developing web services and APIs, which are getting heavy use already."

Associate Director, Enabling Technology  
Northwestern University



## Spotlight Practice

Northwestern University

At Northwestern University, gathering input on critical data needs from distributed IT staff through surveys and focus groups led to increased investment in planned projects and the creation of APIs for reusable integrations for campus-prioritized data.

### Abbreviated Survey Questions

1. Are your current Identity/Demographics data needs fulfilled by the existing Web Services listed on the Service Registry Dashboard? If not, what ID/Demographics data would you like to see as a Web Service?
2. Are your current Academic related data needs fulfilled by the existing Web Services listed on the Service Registry Dashboard? If not, what Academic data would you like to see as a Web Service?
3. Are your current Employment related data needs fulfilled by the existing Web Services listed on the Service Registry Dashboard? If not, what Employment data information do you still need that you would like to see as a Web Service?
4. Is the current Service Oriented Architecture Web Service (SOA WS) environment easy to understand and use ?
5. Can you easily find a web service that meets your needs?

Survey and focus group results showed that ID/Demographic data was a priority for campus, and an ideal starting point for developing APIs

### Selection Criteria for an API Test Project

#### Person-Focused Data Needs

Because the project required person-based profiles, it met prioritized needs from the data survey

1

#### Starting With Existing Funding

More funding added to existing integration funding to install the tool using web services and asynchronous messaging

2

#### Leveraging Vendor- Offered APIs

The vendor offered APIs that Northwestern IT staff could extend to install the new tool

3

#### Available Staff

Ten staff were dedicated to the initial web service development project

4

### Results from the Pilot and Beyond



A new tool to track training for HR and Research Divisions required integration with the SIS and the ERP to auto-populate user profiles, and was integrated using APIs

~25%

Additional funds Northwestern spends on initial integration implementations for web services and asynchronous messaging

100+

Point-to-point connections replaced by internal web services and 40 exposed APIs, lowering annual maintenance costs in subsequent years



# Two-Step Face-to-Face Integration Mapping



## Gaining Visibility into Unit Data Use to Build a Clear Picture of Campus Data Movement

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### Practice in Brief

IT works closely with data users and stakeholders to document existing data flows in a two-step interview and edit process. Developers collect detailed information on data use from end users to create data flow diagrams for review. Stakeholders then review the diagrams and confirm or edit them, ensuring that all data augmentation or processing undergone in units is effectively captured.

### Implementation Steps

- Identify the appropriate group or committee to undertake data mapping efforts (e.g. Data Governance Working Groups, Developer Groups, Integration Competency Center Staff).
- Define the scope of data inquiry, determining which types of data the institution wants to include or exclude from the audit (e.g. financial, personal, academic, research).
- Conduct preliminary face-to-face interviews with data stakeholders to document the use and movement of data between organizational units. Ensure that senior management and data owners, data producers, systems maintenance workers, and process managers are all engaged in the audit conversations to create a thorough understanding of institutional data in motion.
- Use aggregated interviewee information to create the initial data flow maps using tools such as Visio, Kivio, or Dia. Standardize symbols and visualizations across authors early in the process.
- Display created maps in hard-copy and invite interviewees to review the flow diagrams in person. Review maps alongside stakeholders and provide pens to encourage live edits and alterations to the diagrams.
- Review stakeholder adjustments and incorporate into final integration audit maps.

### Benefits to Institution

- » Clear visibility into data use and processing on campus
- » Consistent visual integration mapping around high-use data domains
- » Comprehensive technology system and data audit



The most productive way of discovering the main systems and data flows is to talk directly to the people who manage and/or run them, so arrange meetings with system managers or their delegates.”

Project Leader  
Newcastle University



At Newcastle University, the IDMAPS team conducted a person data audit as a precursor to building standardized integrations to support their personalized learning platform. Focusing on face-to-face conversations and visual data flow diagrams helped maintain stakeholder engagement and create standardized integration documentation.

Further documentation on their process and outputs can be found at: <https://research.ncl.ac.uk/idmaps/resources.php>.

## Engagement Checklist for Stakeholder Interviews

### Who to Engage:

VICE PRESIDENTS,  
DIRECTORS



People driving campus demand for improved data (e.g., senior management, owners for specific projects that rely on data)

FRONTLINE STAFF



People producing and processing data in units and departments around campus

DISTRIBUTED IT



People running the systems in which data is stored

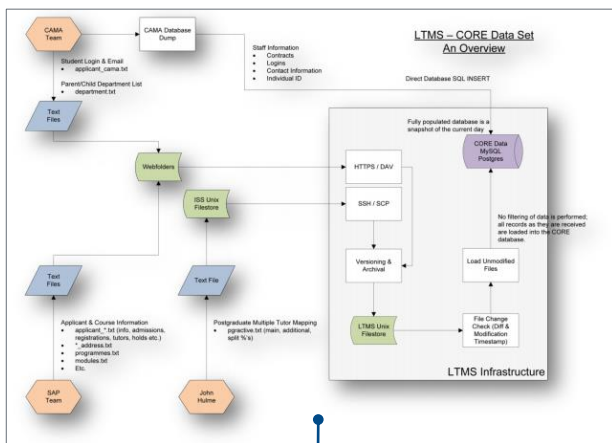


People in charge of the processes through which data is passed between these systems

### What to Ask:

- What systems or services does your team manage or provide?
- What do these systems or services do and who uses them?
- Where do they get their data from and where do they pass their data to?
- Are there any manual processes involved?
- What processing does the input data undergo by the systems or services?

## Sample Integration Data Flow Diagrams



While few data providers and consumers are likely to give feedback on a long text document, printed diagrams often generate constructive comments.

Providing pens for annotation ensures that data users' edits are captured and pressure tested in the room before IT makes the final integration documentation.

# Iterative Enterprise Data Rollout



## Increasing Uptake of Centralized Data Services Through Inclusive Communications

### Practice in Brief

CIOs or enterprise technology directors begin the process of introducing new enterprise data objects (EDOs) six months prior to their rollout on campus. This generous timeline is publicized through multiple channels. It provides a structured process for campus to suggest revisions to the EDOs, and for implementation of changes, prior to the transition. Giving users time to adapt significantly improves uptake at launch and lowers dissent once the new objects are live.

### Implementation Steps

- Determine which data on campus should be prioritized for transformation to reusable integrations. Practices outlined above – campus needs surveys or data integration mappings – may help direct these efforts. At the University of California-Berkeley the changes from ADOs to EDOs were part of a project to replace their SIS.
- Consider business user needs and, if IT opportunities are identical, align reusable integration implementation with lulls in the business user cycle. Begin publicizing the transition six months prior to the chosen implementation date to distributed IT staff.
- Create specific channels or mechanisms for distributed IT staff to provide feedback on reusable integrations, such as message boards. Dedicate staff members to monitoring and responding to feedback.
- Systematically publicize information via emailed memos and social media that outlines:
  - When reusable integration drafts will be available for review by the distributed IT community and data users
  - Mechanisms to provide feedback on drafted reusable integrations
  - What date testing with reusable integrations will begin

### Benefits to Institution

- › All users are aware of upcoming changes to integrations
- › Users have sufficient time to implement changes prior to testing
- › Reusable integrations reflect campus needs

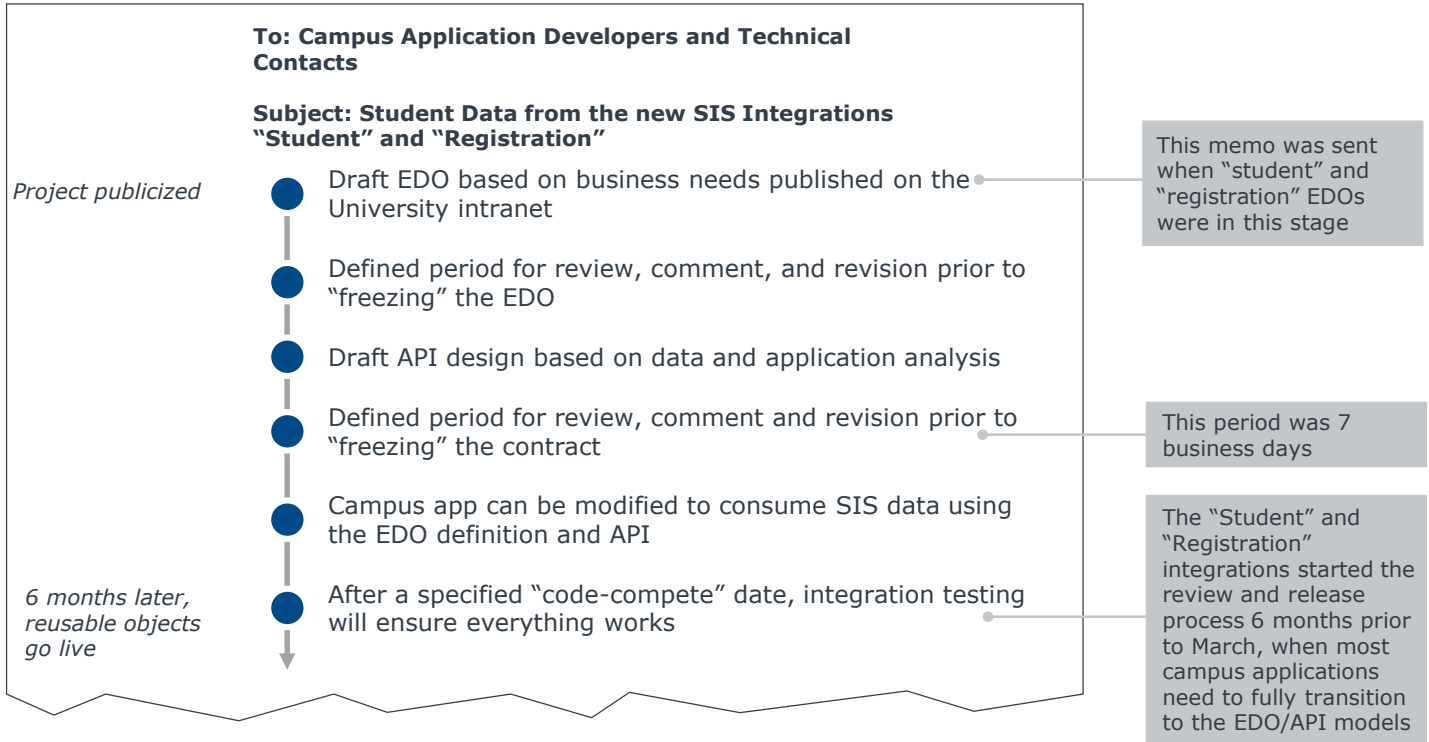


We've moved away from our spaghetti mess of point-to-point integrations to a hub that services 370,000 requests a day for data."

Chief Technology Officer  
University of California-Berkeley



## Memo to Publicize Reusable Objects and EDOs to Distributed IT Staff



## Sample Chat Forum Topics Related to Student Administration and Teaching EDOS and APIs

What's the dataflow for a student who hasn't graduated but isn't attending? Started by jblatt@berkeley.edu	about 2 years ago by russellic
Registration EDO Started by tomouc	about 2 years ago by russellic
graduate student academic progress dates Started by wtf	about 2 years ago by wtf

Forums » Student » What's the dataflow for a student who hasn't graduated but isn't attending?

Reply

jblatt@berkeley.edu

about 2 years ago

Hi,  
I'm trying to understand how we determine that a student is no longer attending. Is there some flag we can look at? What happens with the registration object? Do they get a registration object for the current term with "Eligible to Register" flagged? Would they get a withdrawn flag? Is there something to note they've taken a leave?  
Thanks.

russellic

about 2 years ago

If a student's registration is cancelled or she withdraws, you'll see a "withdrawalCancel" element on the registration associated with that term. Depending on applicable policy, the following term's registration may or may not show eligibleToRegister = true. For eligible terms during which she doesn't attend, you'll see registered = false and no termUnits. I haven't heard from the Records people whether her affiliation.statusDescription will change to "inactive" (or some such) after a withdrawal or a stretch of non-enrolled terms, but I'll check.

A Business & Data Architect on the Integration Services team actively monitors the forums to answer questions and forward feedback

# Consolidated Campus Data Access Point



## Leveraging Ongoing IT Projects to Build a User-Friendly, One-Stop Data Service

### Practice in Brief

High-use enterprise data domains are consistently exposed to systems and users across the institution through one central access point (e.g., an API). User access is federated using a single unique identification key per individual or system. Consolidating high-use data services into one API improves uptake by streamlining data access processes and improving user experience. Where appropriate data is not yet available, new projects are evaluated for their capacity to provide it, and assigned extra implementation funding to make enterprise data available in the one-stop API.

### Implementation Steps

- Identify appropriate high-demand data for aggregation into a single-source data feed for use across all of campus (e.g., at Brigham Young University, data was initially selected in five domains: instructors, courses, classes, students, and locations).
- Within selected universal data domains, identify source systems for master data to be used in universal enterprise data feeds and invest in reusable data integrations to surface identified data for downstream system and end user utilization.
- Expose this data in a single location, with global access controls to limit certain elements to users with appropriate access rights. Assign a single access key per individual for ease of use and tracking purposes.
- For data domains not already collected and aggregated in a useable source system, screen incoming projects to identify opportunities for cleansing and exposing enterprise-quality data to fill in the gaps of enterprise data services.
- On a project-by-project basis, continue to augment the enterprise data set and associated integration feeds to expand the reach of reusable data integrations across a growing set of data domains.

### Benefits to Institution

- › Single, universal version of the truth for high-use data domains
- › Greater developer engagement with simpler data interfaces
- › Increased developer productivity with uniform data protocols and access keys across feeds



A single version of the truth is the only way to go for us. Even if we add in programs, colleges, and departments as new data domains for the University API, it will still be more manageable than the 900 individual data feed resources we have now.”

Enterprise Architect  
Brigham Young University



## DISCUSSION GUIDE

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# Creating Reusable Data Services for Campus

### Using this Report to Speed Consensus for Change

Many Forum members use our research as an occasion to convene IT and campus leaders. Together, they review best-practice lessons from innovative higher education institutions and deliberate about the need to revisit policies, implement new processes, or reallocate staff and budget dollars on their own campuses.

Forum reports now feature self-evaluation diagnostics and discussion guides that IT leaders can use as a backbone for focused working sessions. We recommend that members distribute this report to the relevant stakeholders as pre-reading to establish a common vocabulary and fact base. Then, spend approximately 60 minutes going through the diagnostics and discussion questions to decide whether policy course-corrections or resource re-allocations make sense. Forum staff would be delighted to facilitate such discussions by providing coaching in advance, supporting on a private webconference, or participating live on your campus.

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### Creating a One-Hour IT Team Working Session

**Step 1:** Send report to IT leadership or architecture task force and committees for pre-reading

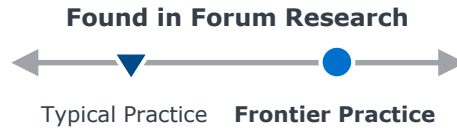
**Step 2:** Convene group to discuss diagnostic questions and assess need for adopting profiled practices

**Step 3:** Contact IT Forum for implementation support:

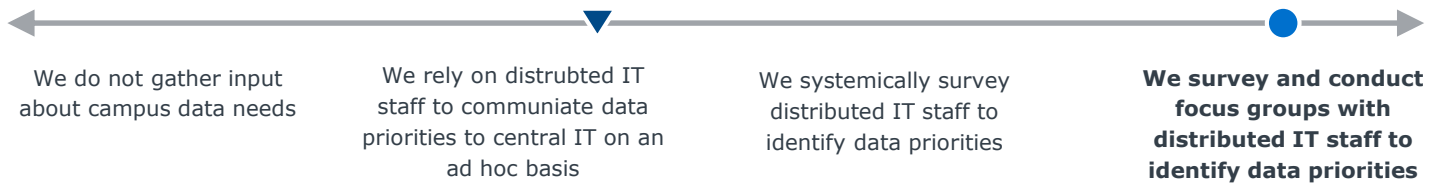
- Unmetered consultation with Forum researchers
- Networking contact with profiled institutions
- Model policy and process templates

# Campus Data Needs Survey

To ensure that diverse campus IT leaders and technicians are engaged in enterprise data efforts, some colleges and universities are surveying distributed technologists to determine users' data priorities. Practitioners believe that establishing data strategy co-ownership between central and distributed IT staff increases engagement, ensures thorough analysis of data object needs, and improves new data object take up.



**1. How do we gather input about data needs on our campus, to prioritize reusable integrations?**



**2. How satisfied would you estimate current users are with access to the following data types?**

	Very Satisfied	Somewhat Satisfied	Not Satisfied
Demographic Data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Identity Data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employment Data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Academic Data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Research Data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial Data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

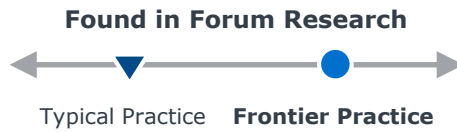
After completing your survey and focus groups, compare these self-test responses against distributed IT feedback.

**3. List below any upcoming projects that offer ideal opportunities to experiment with enterprise-focused integration because they meet the outlined criteria:**

	Requires prioritized data	Is fully staffed and funded	Can leverage vendor-funded APIs
1. _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

# Two-Step Face-to-Face Integration Mapping

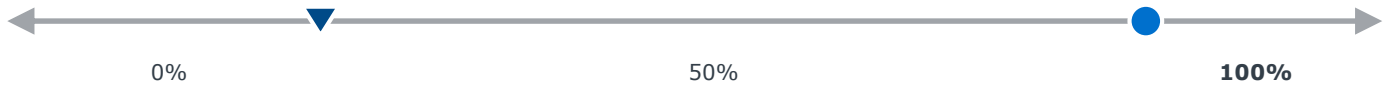
As institutions recognize the need to centrally manage enterprise data objects, some are conducting thorough face-to-face data audits with distributed users to understand the use and movement of data between campus systems. Direct engagement with users brings benefits through nuanced conversations which ensure comprehensive data landscape visibility for IT, which in turn supports the implementation of standardized integration mapping and visualization methodologies.



**1. How does our campus manage enterprise data (e.g., person data, financial data) across our disparate systems and integrations?**



**2. What percentage of enterprise data integrations are comprehensively documented as visual workflows?**



**3. Which campus members do we engage during data auditing?**

**Applicable?**

We have never audited our enterprise data	<input type="radio"/>
None – we rely on system data feed reports and IT awareness only	<input type="radio"/>
Heads of department	<input type="radio"/>
System owners	<input type="radio"/>
Frontline data users	<input type="radio"/>

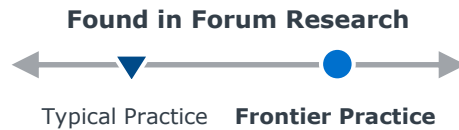
**4. How do we incorporate stakeholder and end user workflow experience when auditing data usage and integration?**



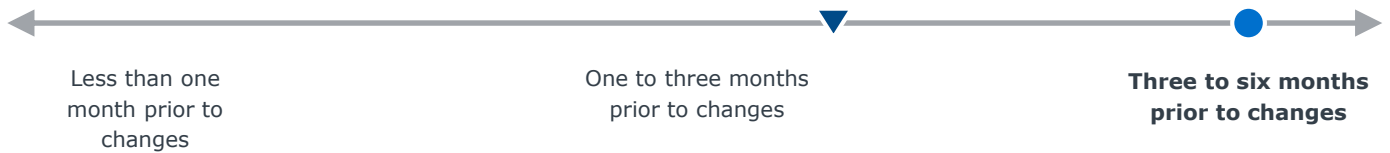


# Iterative Enterprise Data Rollout

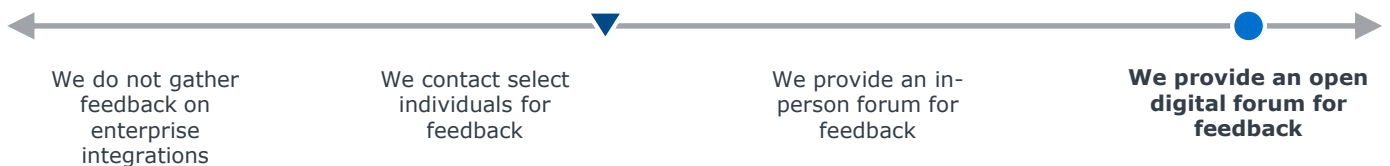
CIOs or enterprise technology directors begin the process to introduce new enterprise data objects (EDOs) six months prior to their rollout on campus. This timeline is publicized through emails to distributed IT and message boards, It allows for campus to provide input for revisions to the EDOs, and for implementation of changes, prior to the transition from application data objects (ADOs).



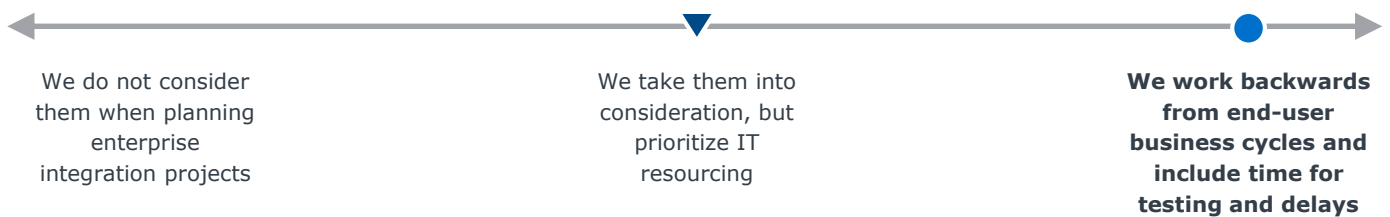
## 1. When do we communicate about upcoming changes to enterprise data objects, or other enterprise integrations?



## 2. How do we gather feedback from the community and distributed IT about proposed changes?

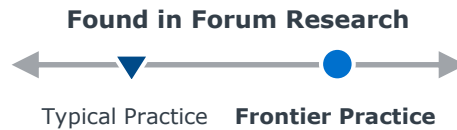


## 3. How do we incorporate end-user business cycles when determining timelines for changing enterprise integrations?

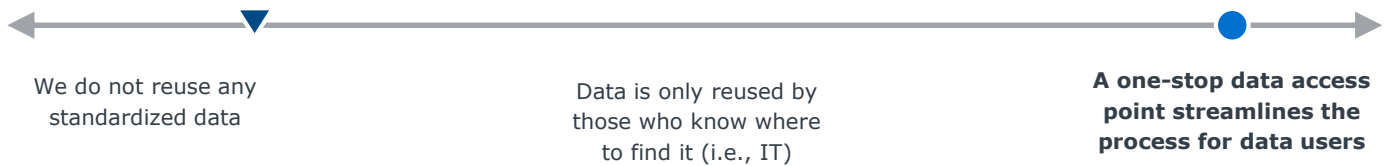


# Project-Driven Data Object Consolidation

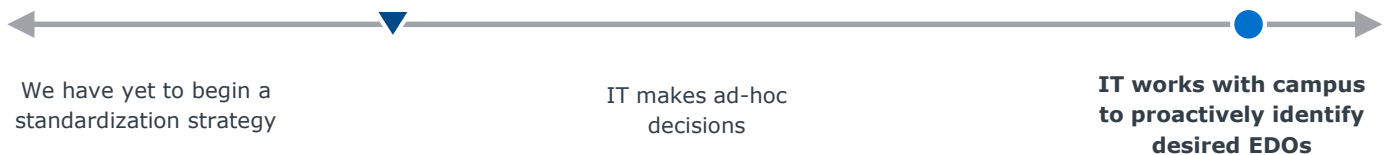
Understanding that uptake is key to scaled data success, some CIOs are consolidating available enterprise data into single-access data hubs. IT projects continue to be the roadmap for campus integration development, but project groups assess new IT initiatives for their potential to contribute to the enterprise data hub, and allocate IT innovation funding appropriately to invest in projects with the capacity to expand and augment available enterprise data.



## 1. How do we promote widespread use of our available standardized enterprise data resources?



## 2. How do we identify new enterprise data domains to incorporate in our standardized integration strategy?



## 3. Which enterprise data objects have we defined, sourced, and scaled across the institution?

	EDO Structure Defined	EDO has Single Source	EDO Available at Scale
Instructors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Classes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Locations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other: _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other: _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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