



# Data Analytics for Institutional Effectiveness at University of Delaware

University of Delaware and HelioCampus, November 2021

# Agenda

## Opening

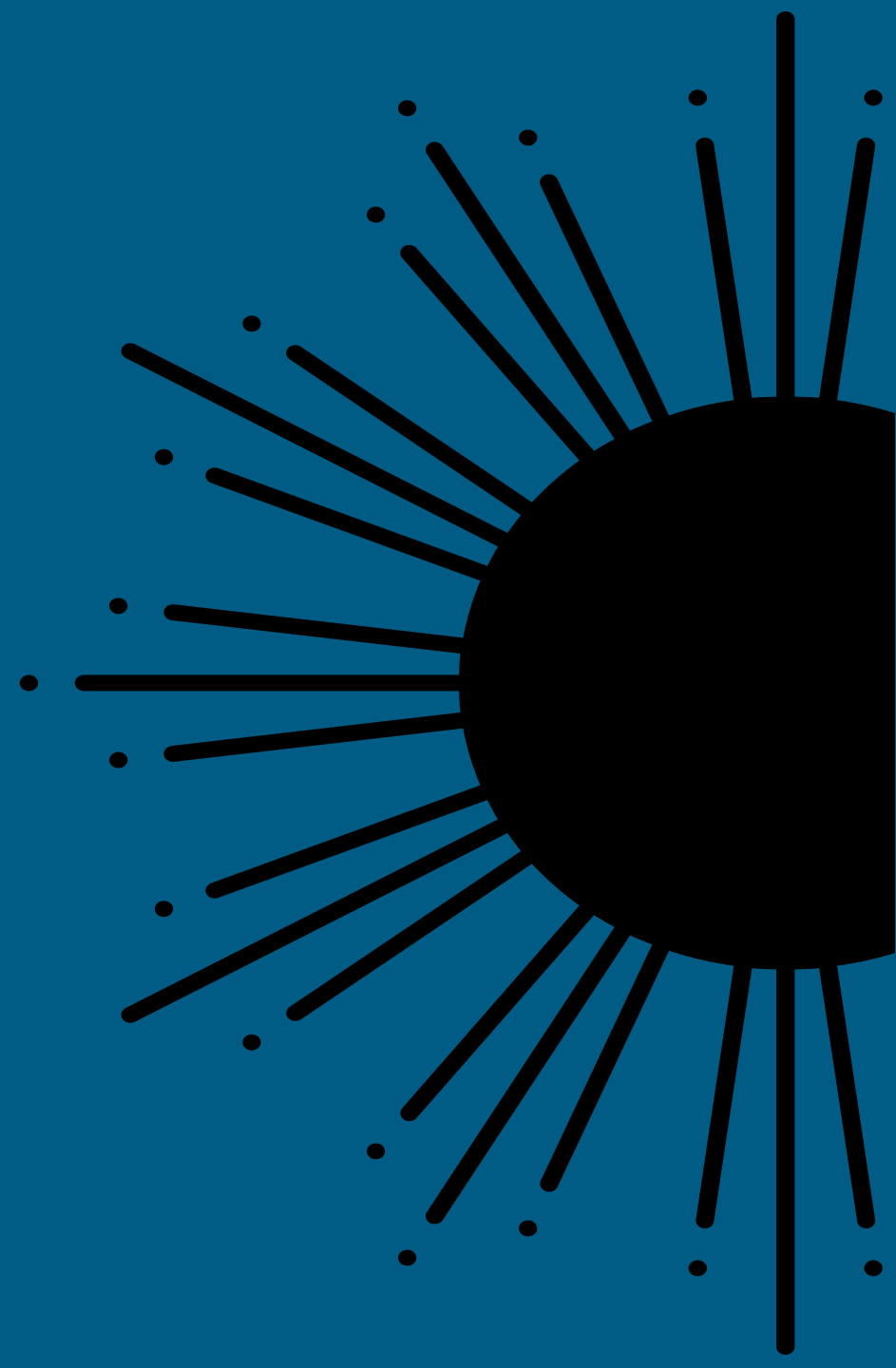
- Presenter Introductions & Background

## Moderated Discussion

- Data Organization
- Use Cases: Role of Data
  - Using data to support strategic planning
  - Using data to support accreditation
  - Using data to support public reporting
  - Using data to support internal operations

## Q&A

# Presenter Introductions



# Introduction to Presenters



## **Richard Reeves**

Associate Vice President of Institutional Research and Effectiveness

@The University of Delaware

# Introduction to Presenters



**Heather Kelly**

Director of Institutional Research

@The University of Delaware

# About the University of Delaware...



The University of Delaware is committed to excellence in undergraduate and graduate education, research and service.

- **State-assisted yet privately governed public institution**
- **Carnegie Doctoral University – Very High Research Activity (R1)**
- **Land Grant, Sea Grant, Space Grant**
- **Carnegie Community Engagement Classification**
- **Located in Newark, Delaware, a suburban community of more than 33,500, situated midway between Philadelphia and Baltimore**
- **23,996 students in fall 2021**
  - 36% Delaware residents
  - Non-residents primarily from NJ, NY, PA, MD
  - 10% are International

# Introduction to Presenters



**Darren Catalano**

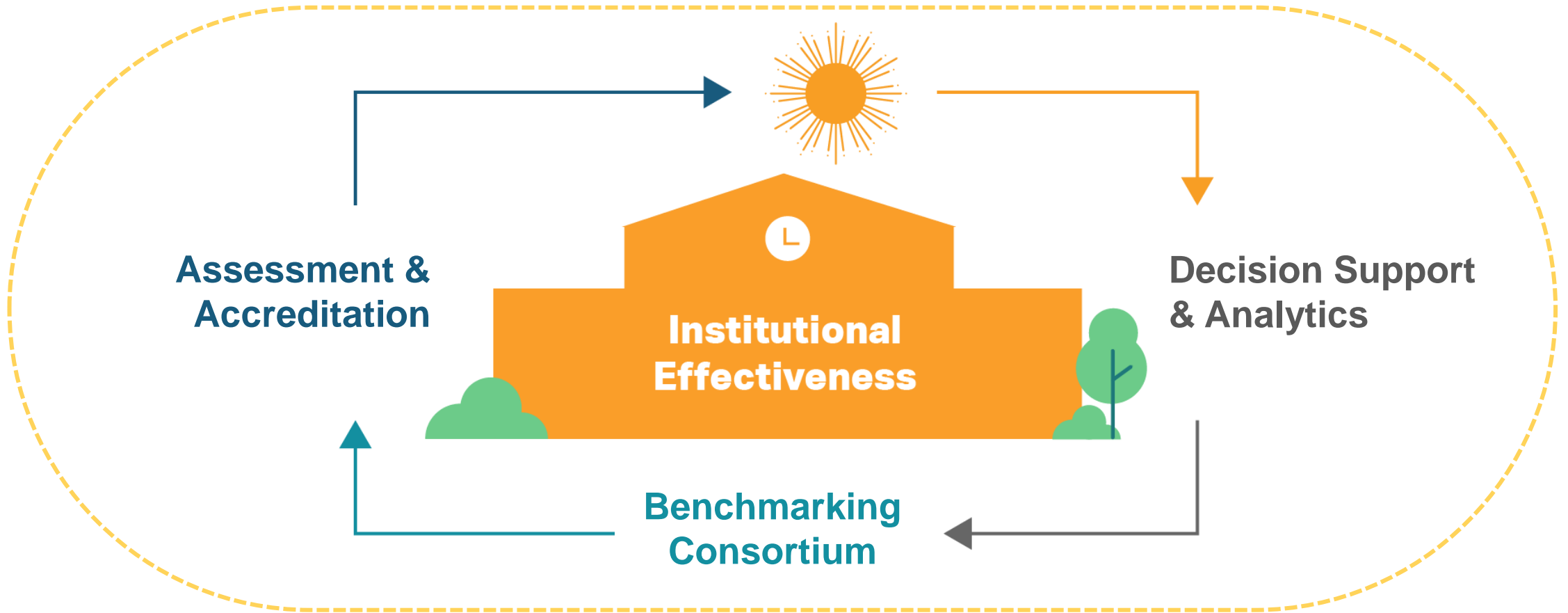
CEO

@HelioCampus

# Our Comprehensive Institutional Effectiveness 2.0 Offering

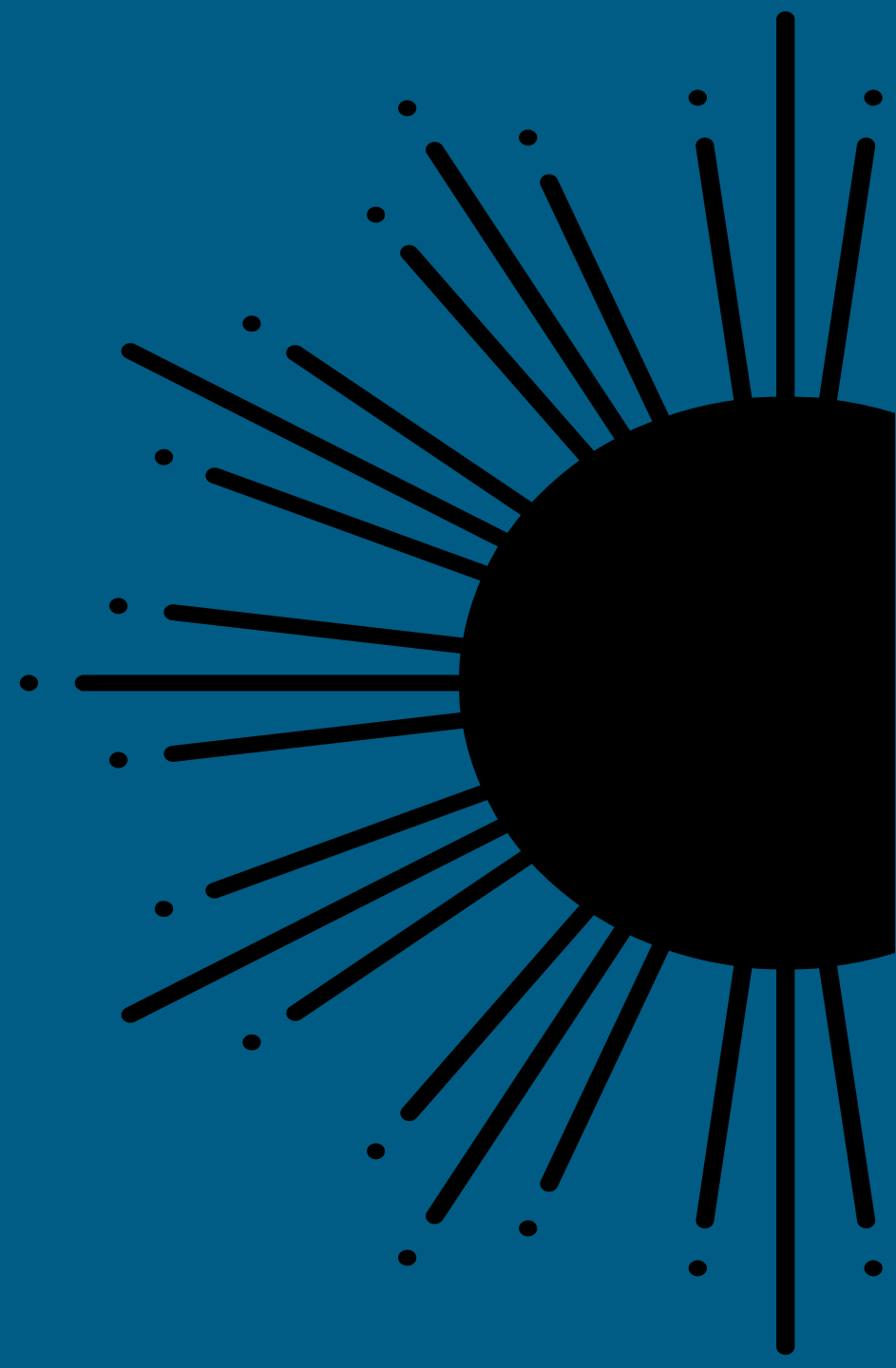
Connecting Investments to Financial and Student Learning Outcomes

*COMMUNITIES OF PRACTICE*





**Moderated Discussion**



**How Do You Organize and Effectively  
Use Your Data?**



# Where to Start? Data Governance

- Data Definitions
- Secure Access
- Critical Partnership with IT



## 3 Models for Leveraging the Platform & Creating a Data Culture

1

### Sharing Staff

Assign staff to work within the IRE office for a defined period to onboard and train new and existing staff. This may stretch resources, but staff leave trained and able to practice best methods.

2

### Supporting an Office

It is important to build client relationships and become a SME within an office to ensure staff understand the context of the data and are focused on the analyses and requests that will make the biggest impact

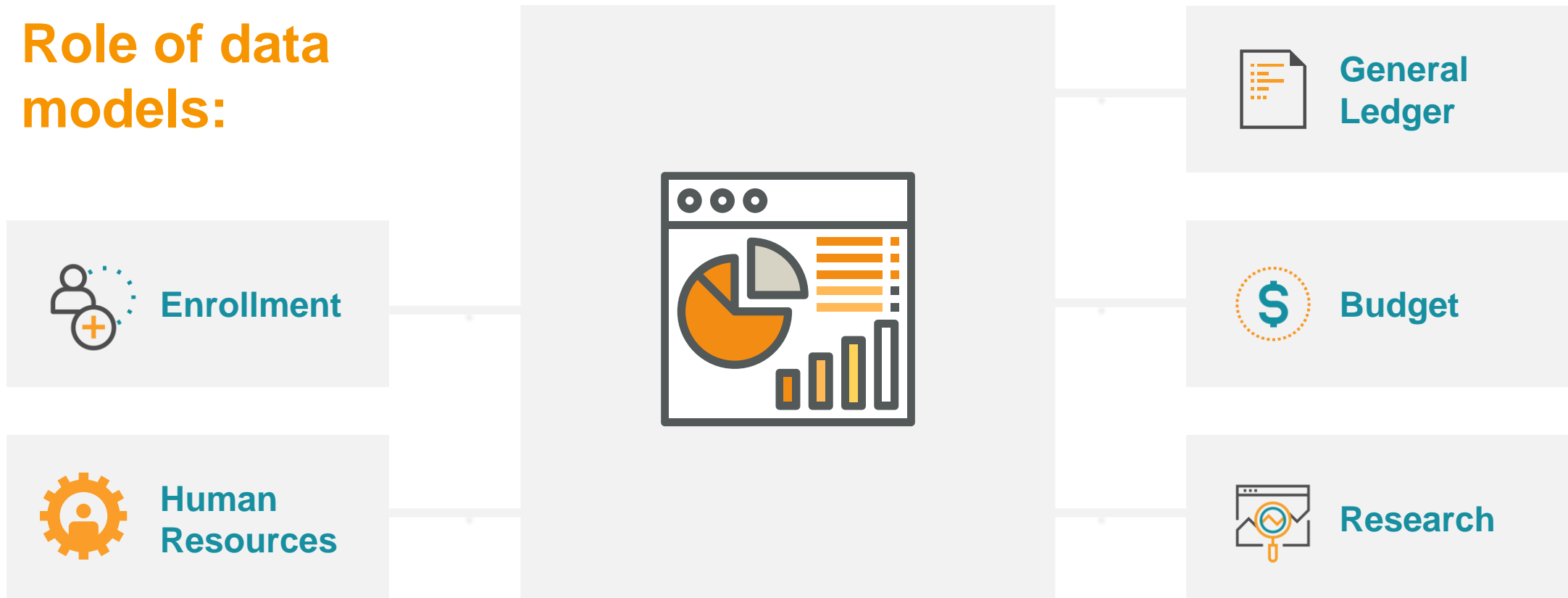
3

### Sharing the Platform

Developing governed and curated data models and dashboards allow offices to have the autonomy and self-service capabilities with review from IRE.

# Data Platform & Technology

## Role of data models:



# Data Platform & Technology



## Value of having Redshift



### Crosswalks

Departments to  
programs to  
budgetary units



### Student retention probabilities for forecasting

Merging in retention  
probabilities with other  
student information



### Ability to freeze at any time



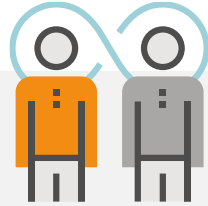
### Merging disparate data models

(i.e. class size and  
DFW reports)

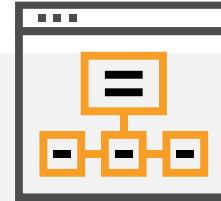
# Role of Data Cleaning



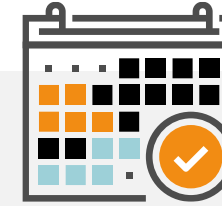
**Data cleaning –  
2-3 months**



**Partner with HR  
and Provost to  
ensure counting  
and onboarding  
correctly**



**HR file extract for  
IPEDS ready**



**Oct 1 Freeze**

# Role of Communication

- **Building reports vs. establishing appropriate use**
- **Flow of Communication:**
  - There is now a clear need to role these reports out to deans and directors with each units specific metrics.





# Timeline – Example of the Human Resources Extract

July

Kick-Off meeting with HR Payroll, Provost Office and IRE

August

Check and correct data for current employees

Check data for errors with current employees

September

Ensure new hires are in system

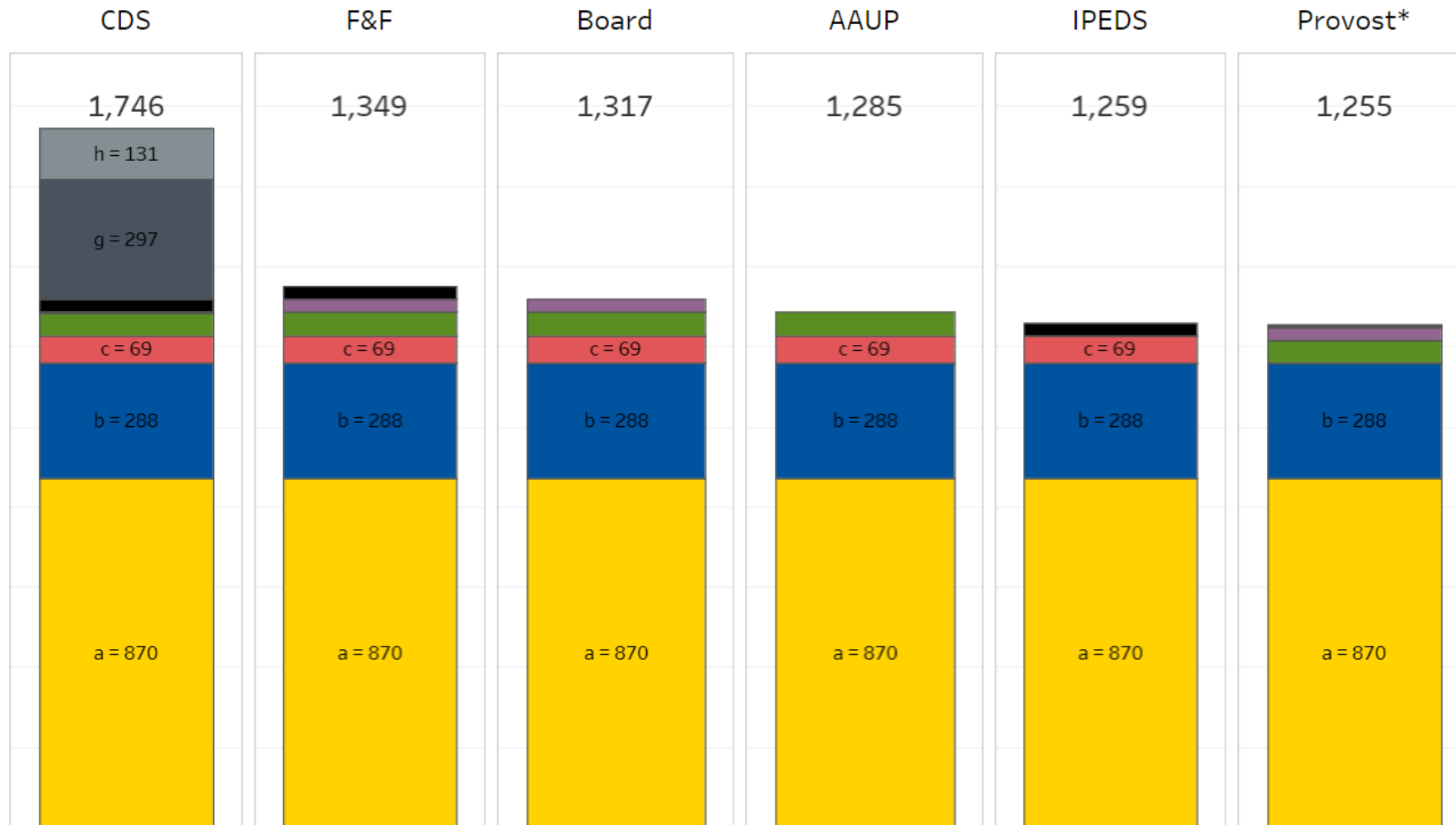
Final Error review

October

Oct 1 Freeze Date

0 Tenure vs. Job Code Errors	0 Tenure vs. Rank Errors	0 EEO Code Errors	3 Full Time/Part Time Errors
0 IPEDS Errors	0 Job Group Errors	0 Job Rank Errors	0 Rank Faculty Errors
0 Tenure Faculty Errors	0 Tenure Track Granted Date Errors	0 Tenure Track Start Date Errors	0 US SOC Code Errors
0 Terminal Degree Code Errors	7 Salary Plan Pay Group Errors	3 Grade Errors	7 Ranking Group Errors

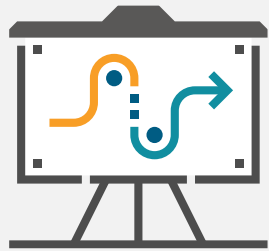
# Data Complexity



## 4 Use Cases: How You Are Using Data?



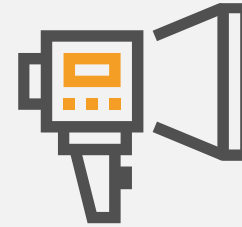
# Use Cases



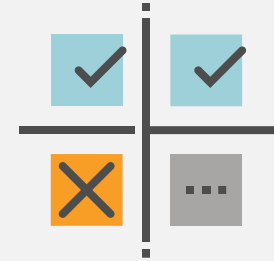
**Strategic  
Planning**



**Accreditation**



**Public  
Reporting**



**Internal  
Decision  
Support**

**How Do You Use The Data To Support  
Your Strategic Planning Process?**



# Strategic Presidential Priorities



**Enhancing the  
success of our  
students**



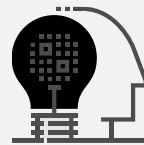
**Building an  
environment of  
inclusive excellence**



**Fostering a spirit of  
innovation and  
entrepreneurship**



**Strengthening  
interdisciplinary and global  
programs**

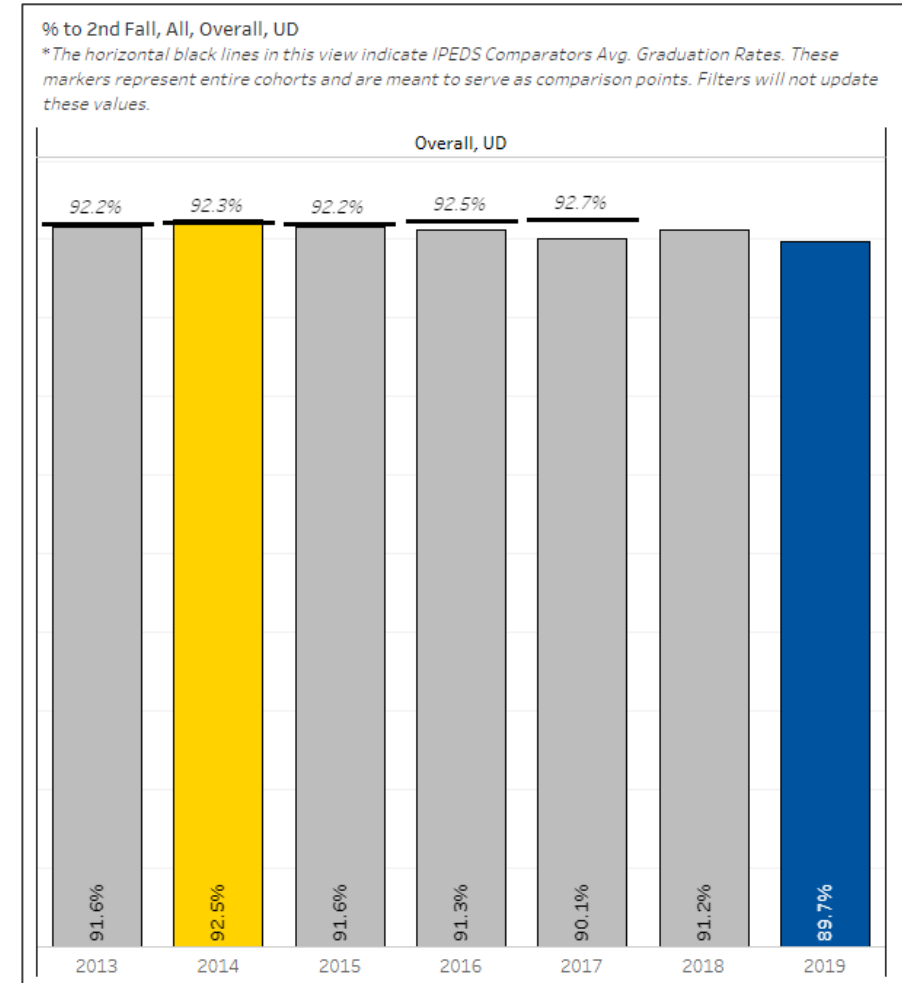
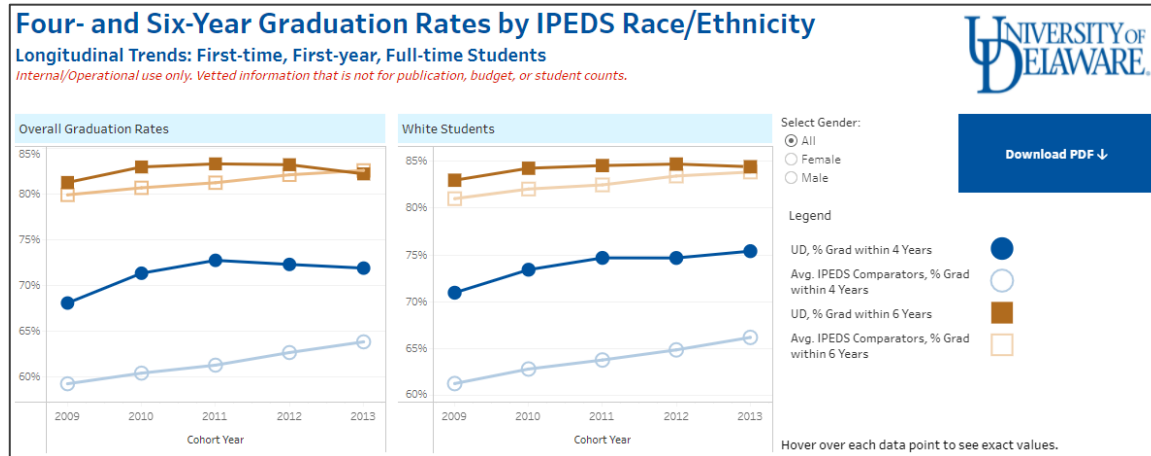


**Investing in  
our intellectual  
capital**

# Strategic Presidential Priorities

## *Enhancing the success of our students*

- **Retention 1<sup>st</sup> to 2<sup>nd</sup> year**
  - 2<sup>nd</sup> to 3<sup>rd</sup> year
  - 3<sup>rd</sup> to 4<sup>th</sup> year
- **Graduation Rates 4-, 5-, 6-year rates**
- **Honors degrees**



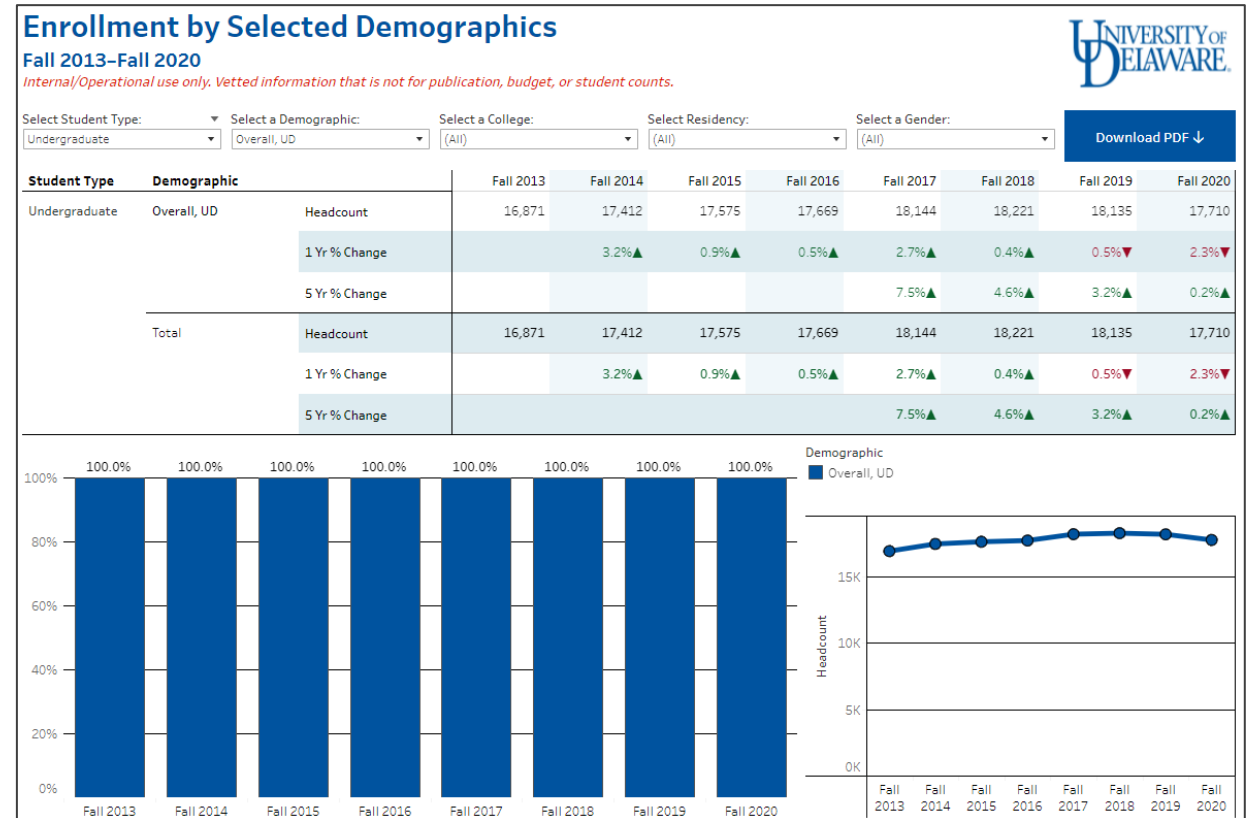


# Strategic Presidential Priorities

## Building an environment of inclusive excellence

### Fall Enrollment changes over time by selected groups:

- Associates in Arts/ Undergraduate/ Graduate
- Residency
- First generation/ low income/ Pell grant/ domestic URM/ Veteran
- College
- Gender

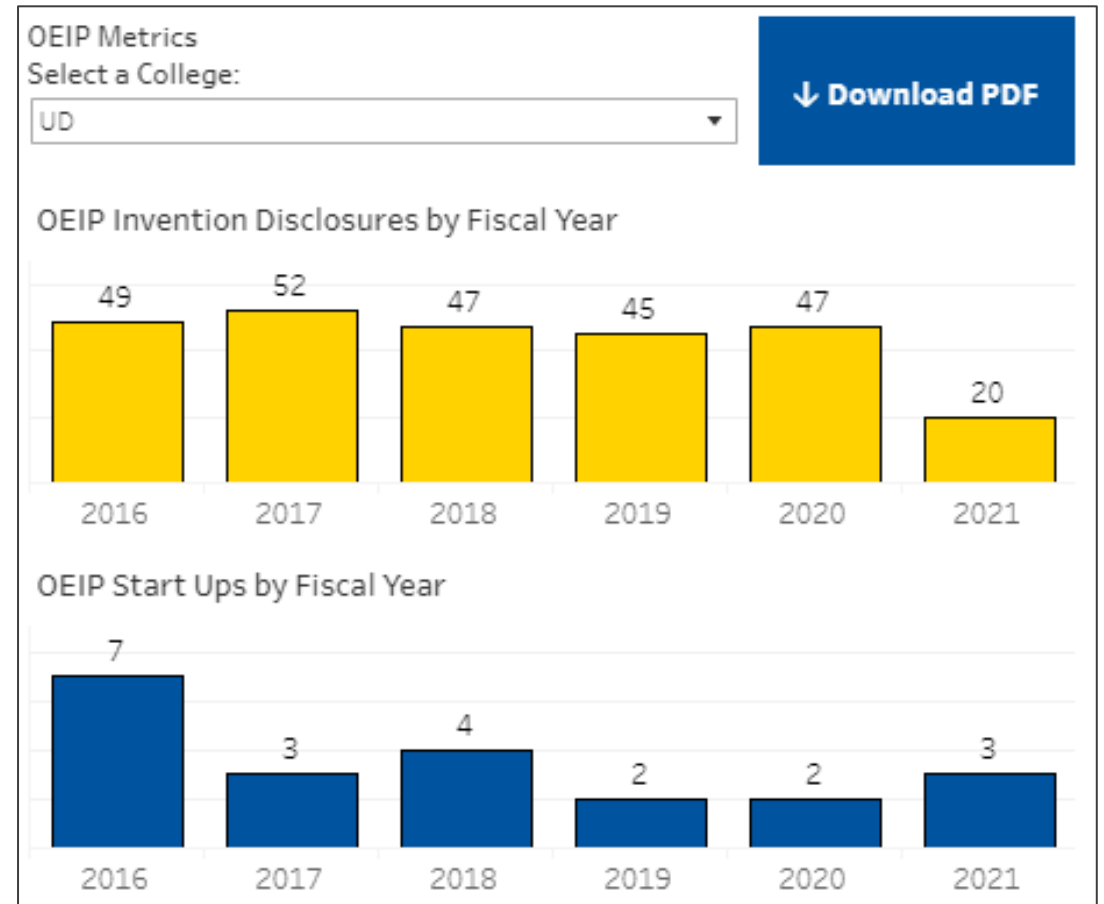


# Strategic Presidential Priorities

## *Fostering a spirit of innovation and entrepreneurship*

- OEIP Invention Disclosures by Fiscal Year
- OEIP Start Ups by Fiscal Year
- OEIP License Agreement by Fiscal Year
- OEIP Sponsored Research by Fiscal Year

**These are tracked by college but additional data linkages are difficult**



# Strategic Presidential Priorities

## *Investing in our intellectual capital*

### Research Expenditures (total and per FTE)

- By college

### Public Service Expenditures

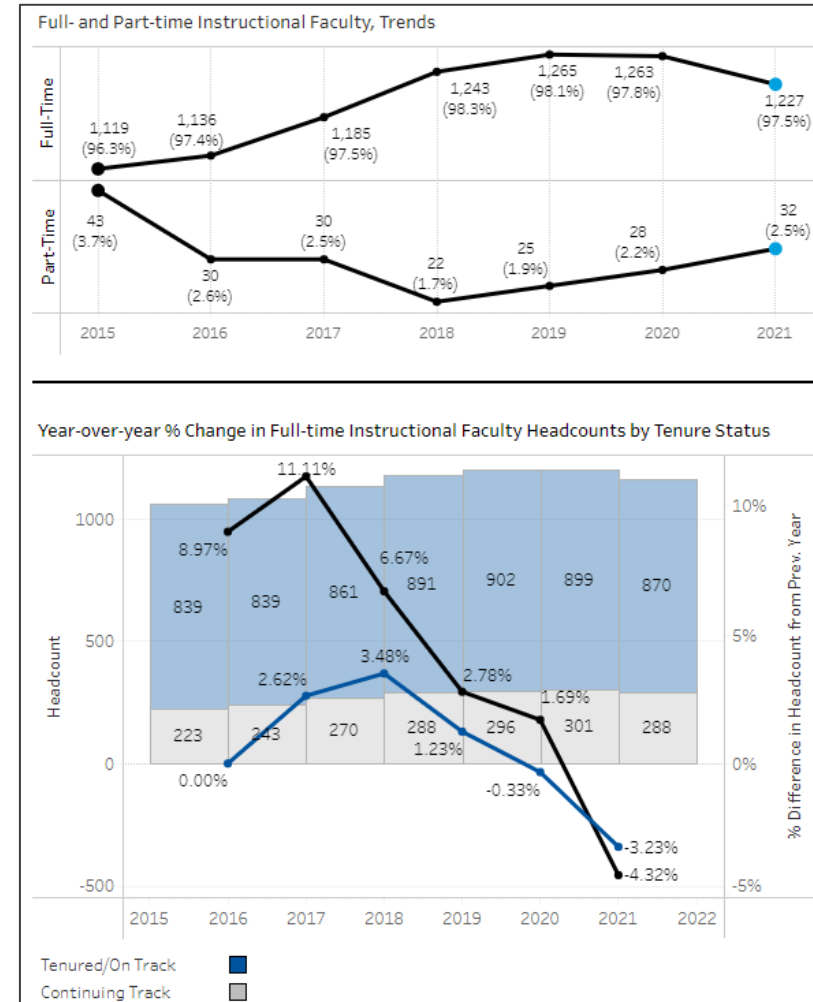
- By college

### Lecture Hours taught by tenure status

- By college and Undergraduate/Graduate

### Faculty counts and hiring by year

- By college



# Strategic Presidential Priorities

## Strengthening interdisciplinary/global programs

### International Students

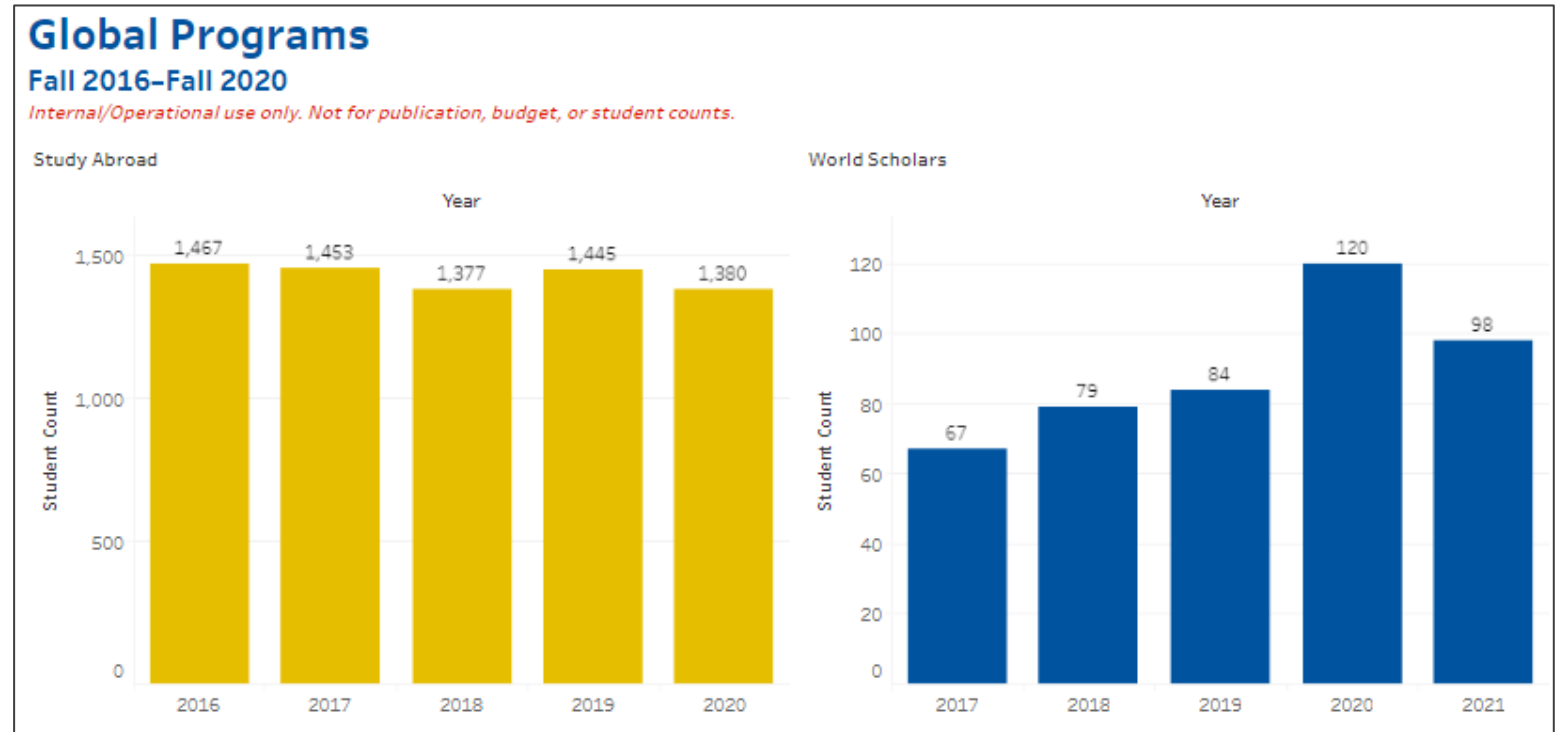
- With comparison institutions and IPEDs data

### Global Programs

- Study Abroad
- World Scholars

### International Employees

- Faculty
- Staff



**How Do You Use This Same Data  
To Support Accreditation?**



# Standards / Criteria / Requirements

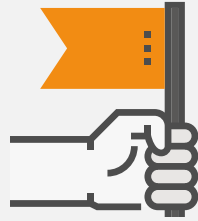
- Mission
- Strategic Planning & Priorities
- Ethics & Integrity
- Student Learning Experience
- Learning Outcomes Assessment
- Planning & Resources
- Administration
- Governance & Leadership
- Institutional Improvement



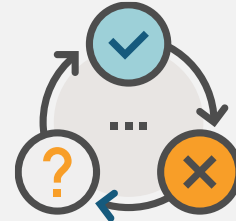
# Central Threads Running Through All Accreditation Requirements



Planning must be **systematic**



Planning must be rooted in an **institution's mission**



Planning must be predicated on **analytical and evaluative information**



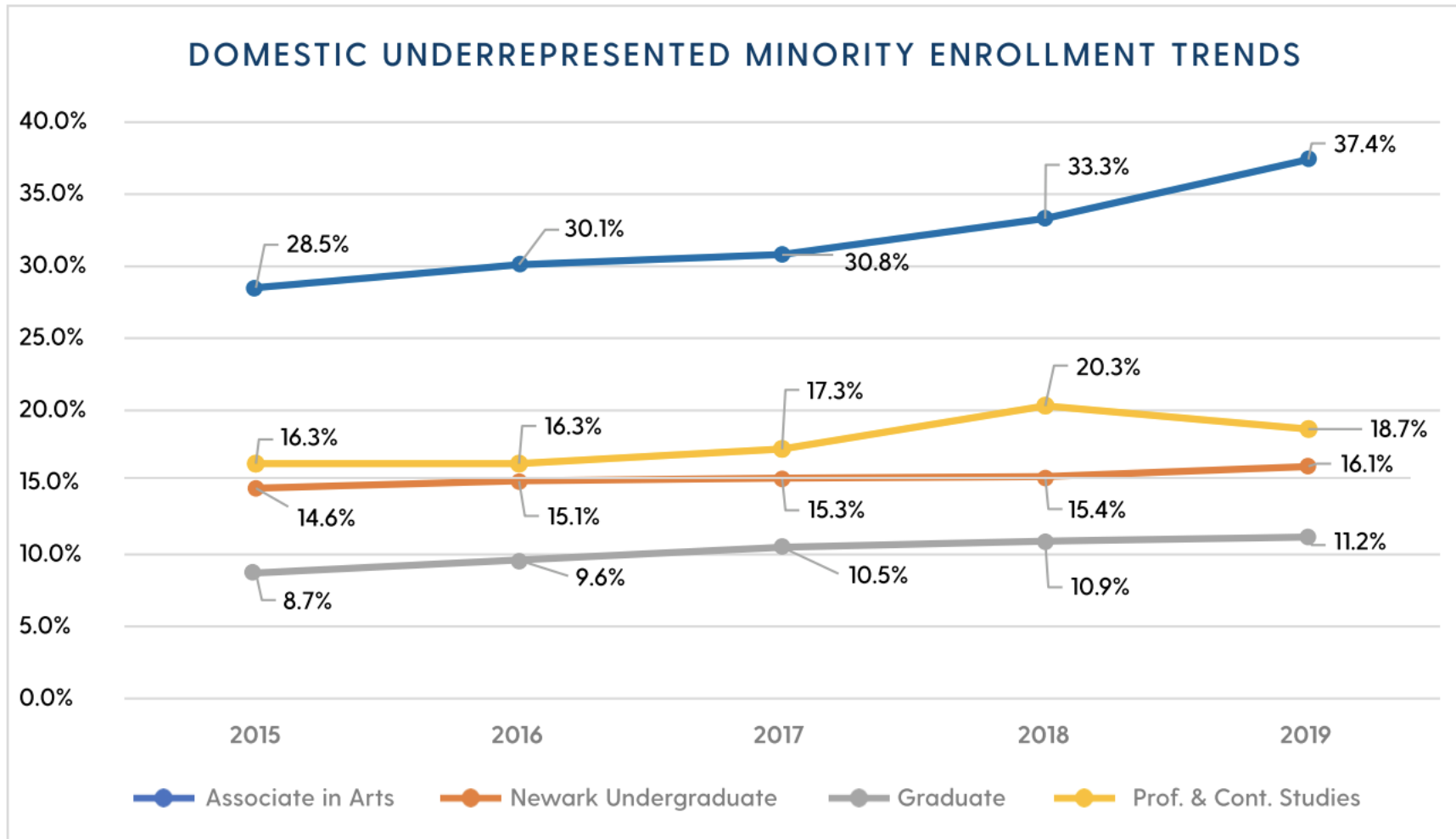
Planning **must be used** for institutional decisions, including resource allocation

# Mapping Accreditation Standards to Institutional Priorities

	<i>Standard I Mission &amp; Goals</i>	<i>Standard II Ethics &amp; Integrity</i>	<i>Standard III Design &amp; Delivery of the Student Learning Experience</i>	<i>Standard IV Support for the Student Experience</i>	<i>Standard V Educational Effectiveness Assessment</i>	<i>Standard VI Planning, Resources &amp; Institutional Improvement</i>	<i>Standard VII Governance, Leadership &amp; Administration</i>
Student Success	(X)	(X)	X	X	X	(X)	
Innovation and Entrepreneurship	(X)	(X)	X			X	
Inclusive Excellence	X	X	(X)	X	(X)	(X)	
Interdisciplinary and Global Programs	(X)	(X)	X	(X)	(X)	(X)	
Intellectual and Physical Capital	(X)	(X)	(X)	(X)		X	X



# Data to Support Accreditation



# Lessons Learned

**What did the data tell us?  
What else do we need to know?**



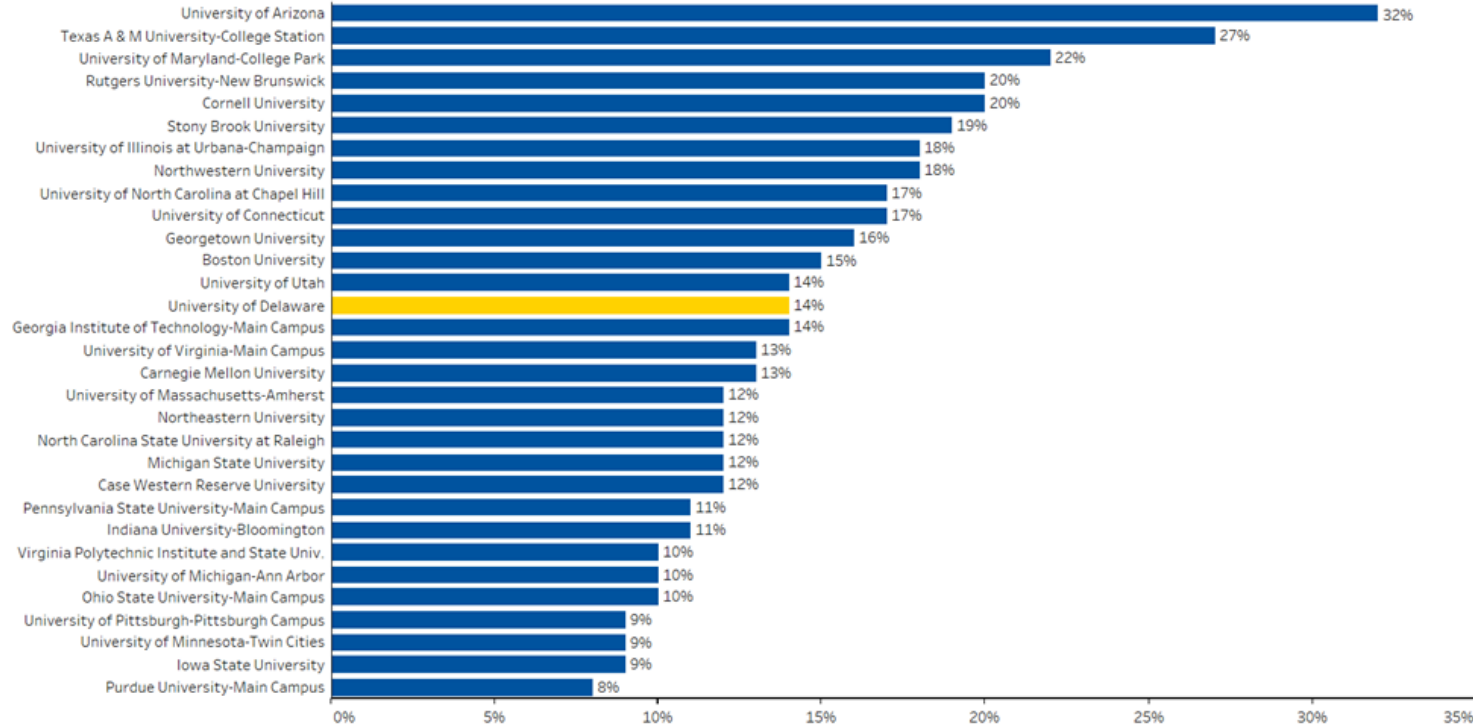
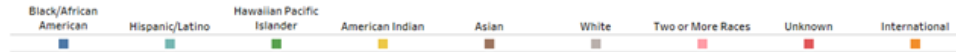
## Fall 2018 Undergraduate and Graduate Enrollment by IPEDS Race/Ethnicity: UD vs. IPEDS Data Feedback Report (DFR) Comparators



Select a Student Population  
 Graduate  
 Undergraduate

Select a Metric  
 Enrollment by IPEDS Race/Ethnicity  
 Enrollment by IPEDS Domestic URM Status

For "Enrollment by IPEDS Race/Ethnicity" Metric, click an option in the legend below to filter and click again to reset.



Note: Percentages may not sum to 100 due to rounding.  
 Data Source: IPEDS Fall Enrollment Survey  
 Documentation: <https://docs.ire.udel.edu/docs/dashboards/ipeds-racial-diversity/>

IPEDS Racial Diversity Indicators: UD vs. Comparators v1.0.0  
 As of: 07/09/2020 8:08 PM  
 Generated: 5/19/2021 12:11:46 AM  
 Accessed by: Heather Kelly

## IPEDS Racial Diversity Indicators: UD vs. Comparators

Race/Ethnicity Group  
 Black/African American

Select a Comparison Group  
 IPEDS Data Feedback Report Comparison Group

To highlight UD in box plots, click on "UD" in the legend below:  
 ■ UD ■ Comparators

To Highlight Another Institution in Box Plots, Enter Its Name in the Field:  
 Highlight Institution



Data Sources: IPEDS Fall Enrollment Survey, Graduation Rates Survey, and Human Resources Survey  
 Documentation: <https://docs.ire.udel.edu/docs/dashboards/ipeds-racial-diversity/>

IPEDS Racial Diversity Indicators: UD vs. Comparators v1.0.0  
 As of: 6/25/2020 2:11:32 PM  
 Generated: 11/12/2021 11:35:12 AM  
 Accessed by: Heather Kelly

## Trends in Four- and Six-Year Graduation Rates\* by Gender and IPEDS Race/Ethnicity: UD vs. IPEDS Comparators

(\*For cohorts of Bachelor's or equivalent degree-seeking undergraduate students)

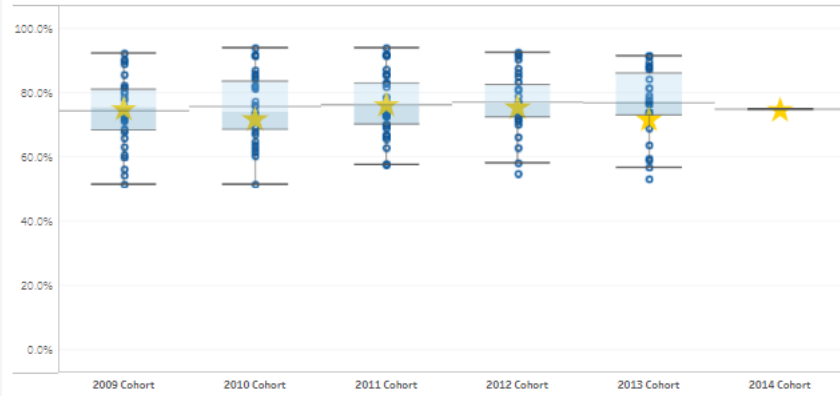


% Grad within 6 years

Institution	2009 Cohort	2010 Cohort	2011 Cohort	2012 Cohort	2013 Cohort	2014 Cohort
Boston University	81.4%	85.0%	85.8%	86.1%	86.0%	86.0%
Carnegie Mellon University	79.9%	81.7%	83.0%	81.1%	81.5%	
Case Western Reserve University	72.3%	72.2%	73.6%	72.0%	73.9%	
Cornell University	88.8%	91.5%	91.6%	90.3%	91.3%	
Georgetown University	92.3%	94.1%	93.8%	92.0%	91.4%	
Georgia Institute of Technology-Main Campus	79.8%	81.9%	78.7%	81.0%	84.3%	
Indiana University-Bloomington	67.8%	64.6%	66.8%	70.1%	68.9%	
Iowa State University	56.3%	60.3%	62.9%	62.7%	59.4%	
Michigan State University	59.9%	62.5%	66.4%	65.1%	63.5%	
North Carolina State University at Raleigh	88.5%	73.8%	72.9%	74.9%	78.4%	
Northeastern University	82.2%	87.0%	82.8%	87.5%	87.2%	
Northwestern University	90.3%	91.8%	91.4%	92.5%	89.4%	
Ohio State University-Main Campus	75.2%	76.1%	76.3%	73.7%	76.4%	
Pennsylvania State University-Main Campus	74.5%	75.9%	72.5%	75.6%	53.1%	
Purdue University-Main Campus	66.0%	69.3%	69.7%	71.1%	73.7%	
Rutgers University-New Brunswick	74.4%	71.6%	73.4%	73.3%	79.2%	
Stony Brook University	63.0%	66.9%	65.5%	71.9%	73.6%	
Texas A & M University-College Station	71.1%	72.7%	75.7%	74.2%	73.9%	
University of Arizona	54.3%	51.4%	57.6%	58.1%	59.0%	
University of Connecticut	72.7%	73.0%	74.2%	76.4%	77.4%	
University of Delaware	75.2%	71.9%	76.4%	75.6%	71.9%	74.8%
University of Illinois at Urbana-Champaign	77.7%	81.3%	76.8%	76.4%	76.5%	
University of Maryland-College Park	80.2%	82.2%	81.6%	79.0%	81.3%	
University of Massachusetts-Amherst	71.6%	67.7%	68.8%	72.7%	71.9%	
University of Michigan-Ann Arbor	81.5%	84.3%	85.2%	83.5%	87.8%	
University of Minnesota-Twin Cities	60.7%	63.7%	72.9%	76.7%	73.4%	
University of North Carolina at Chapel Hill	85.7%	85.9%	87.2%	85.2%	88.2%	
University of Pittsburgh-Pittsburgh Campus	75.5%	69.3%	70.4%	77.1%	77.5%	
University of Utah	51.4%	61.3%	57.7%	54.6%	56.5%	
University of Virginia-Main Campus	89.9%	91.8%	92.1%	91.5%	91.4%	
Virginia Polytechnic Institute and State Univ.	78.3%	77.3%	77.1%	81.0%	77.6%	

Download PDF ↓

- Select Four- or Six-Year Graduation Rates
- % Grad within 4 years
  - % Grad within 6 years
- Select Gender
- All
  - Female
  - Male
- Select IPEDS Race/Ethnicity
- All
  - Amer. Indian/Alaska Native
  - Asian
  - Black/African American
  - Hispanic/Latino
  - International
  - IPEDS Domestic URM
  - Other Race/Ethnicity
  - White



Click "UD" to highlight UD and click again to reset:  
■ UD  
■ IPEDS Comparators



Data Source: IPEDS Graduation Rates Surveys. There is no comparison data for the most recent year; data reflects what UD submitted to IPEDS but has not yet been released.  
 Note A. IPEDS Domestic URM includes four race/ethnicity categories reported to IPEDS: Black/African American, Hispanic/Latino, American Indian/Alaska Native, and Native Hawaiian/Other Pacific Islander.  
 Other Race/Ethnicity includes Native Hawaiian or Other Pacific Islander, Two or More Races, Race/Ethnicity Unknown.  
 Note B. Data on four-year graduation rates for Northeastern are not available in IPEDS.

Graduation Rates by Gender and Race/Ethnicity: UD vs. IPEDS Comparators v1.0.0  
 As of: 4/2/2021  
 Gen: 11/12/2021 11:38:12 AM  
 Accessed by: Heather Kelly

# Use Cases- Accreditation

**Academic Program Reviews (APR) covers two standards: Design and Delivery of the Student Learning Experience and Educational Effectiveness Assessment**

## Student Information

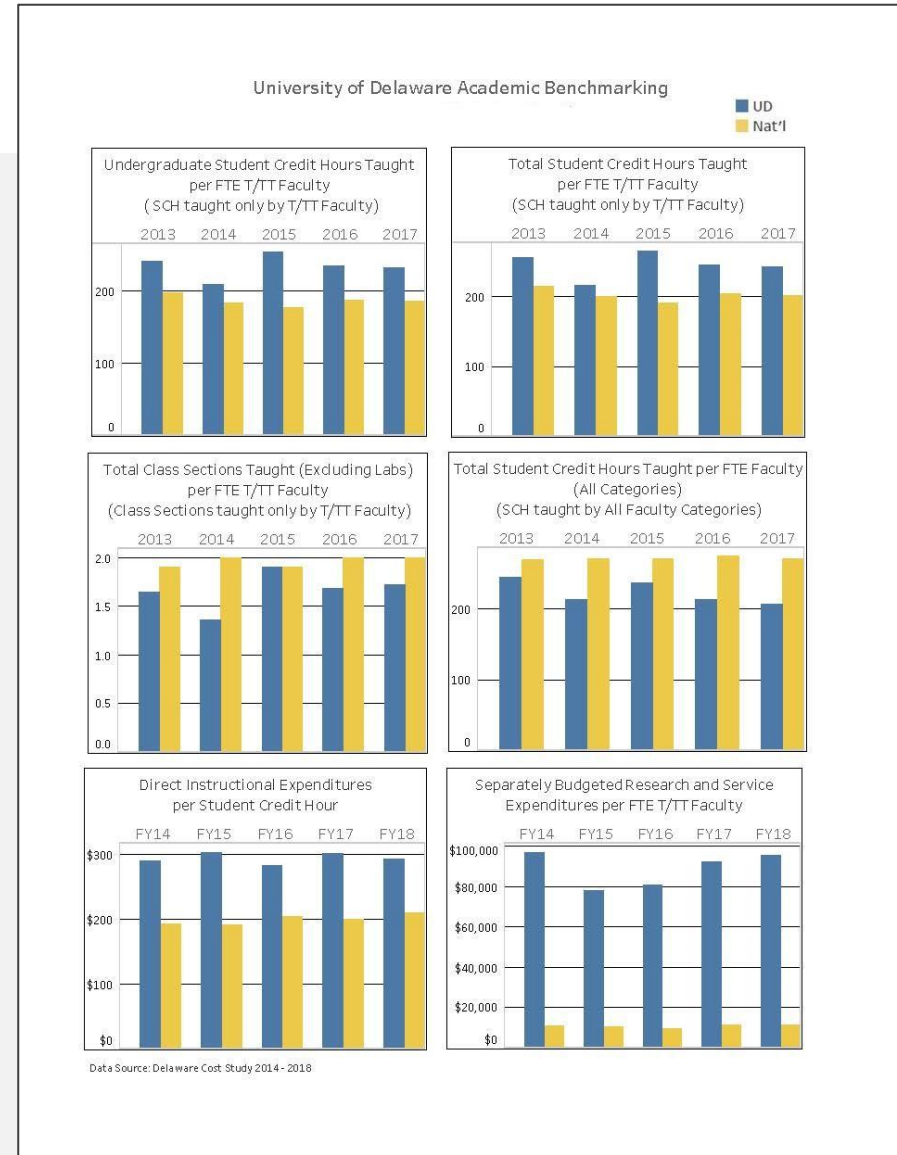
- Entering students by major, average HS GPA, rank and SAT
- Student enrollment by gender, ethnicity, residency, SCH
- Retention and Graduation Rates
- Degrees Granted
- Student Quality (application and admission trends)

## Human and Fiscal Resource Information

- Faculty by tenure status, rank, gender, ethnicity
- The Cost Study for instructional costs and productivity (e.g., direct instructional expenses)  
<https://ire.udel.edu/cost/>
- Faculty Scholarly Productivity data from Academic Analytics<sup>©</sup>  
<https://ire.udel.edu/ir/academic-program-review/>

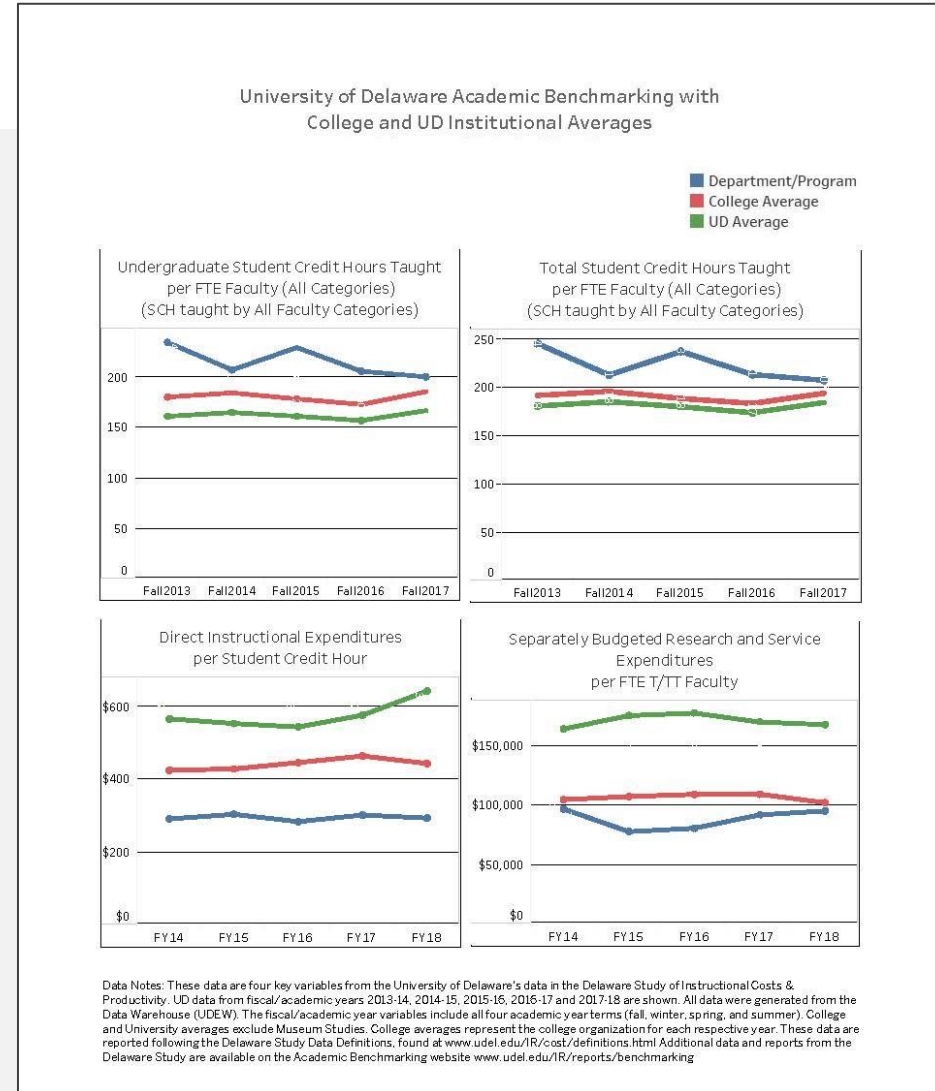
# Cost Study

The Cost Study for instructional costs and productivity (e.g., direct instructional expenses)  
<https://ire.udel.edu/cost/>



# Cost Study

The Cost Study for instructional costs and productivity (e.g., direct instructional expenses) <https://ire.udel.edu/cost/>





**How Do You Use This Same Data  
For Public Reporting?**



# Data to Support Public Reporting

- **Options:**

Facts & Figures



IPEDS



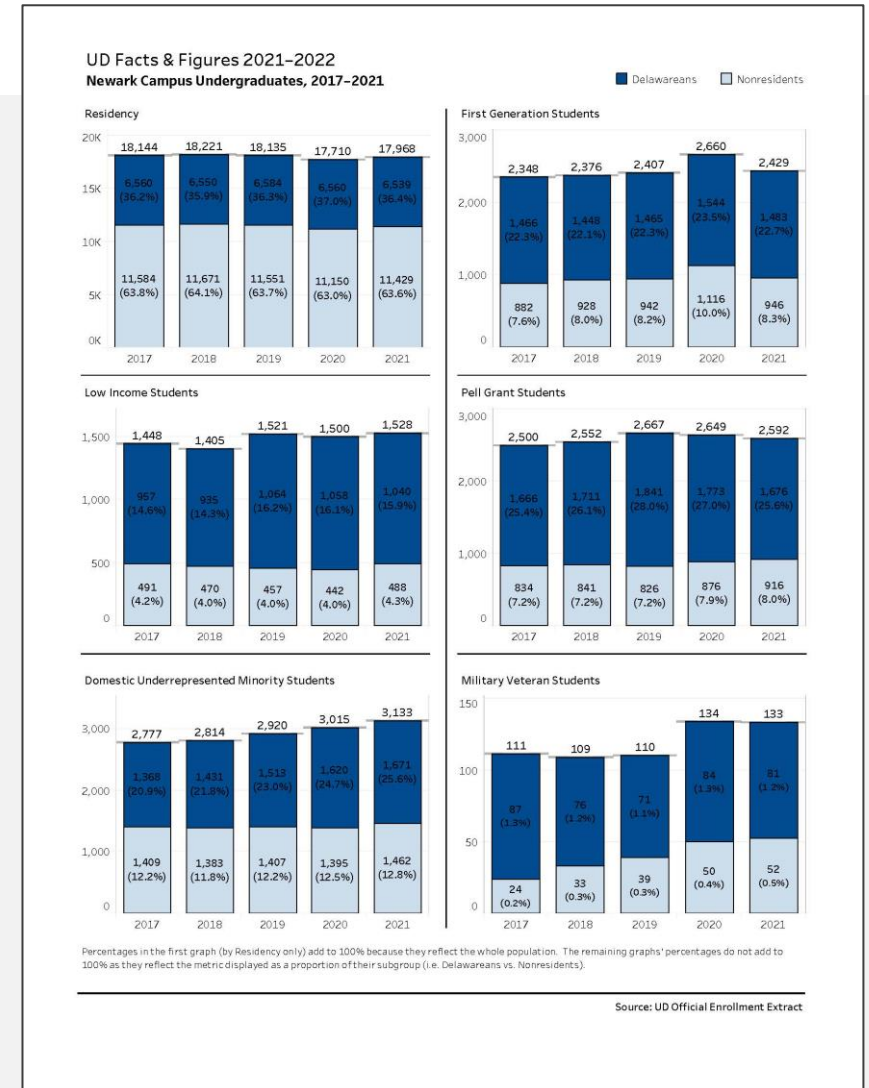
US News  
(Common Data Set)



- **Data freezing**
- **Census vs. Live data uses**

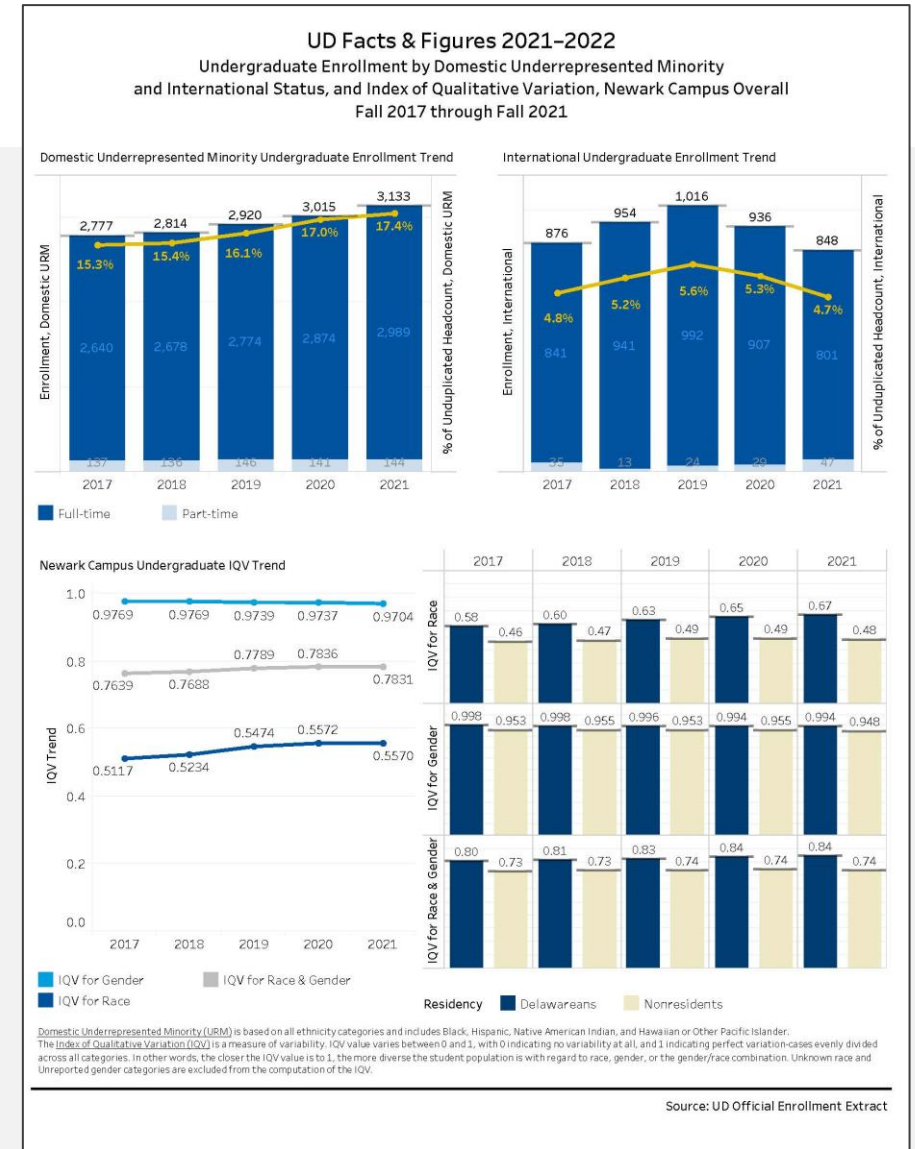
# Use Cases - Public Data: Facts & Figures

## Enrollment by Residency and Selected Demographic Characteristics



# Use Cases - Public Data: Facts & Figures

## Enrollment by Domestic URM, International Status and Index of Qualitative Index (IQV)



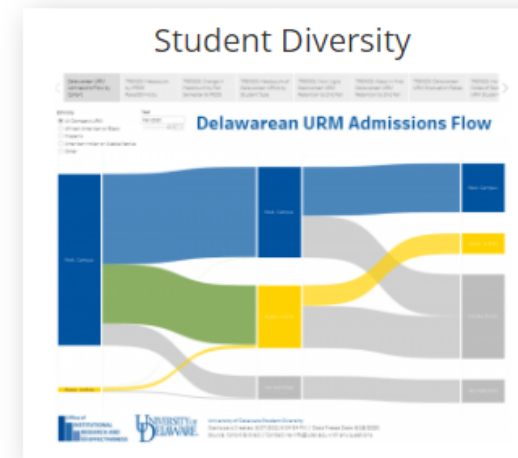
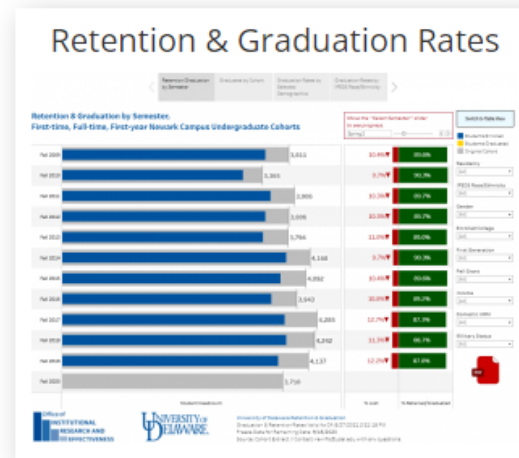
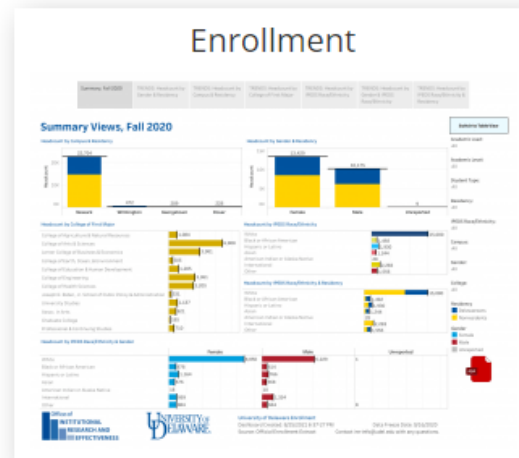
# Use Cases - Public Data: Tableau Public Dashboards

## IRE Dashboards

The dashboards below are public facing and intended for use by our campus community and external stakeholders (no log in required). These dashboards are hosted on Tableau Public. If you have any questions or suggestions, please contact us at [ire-info@udel.edu](mailto:ire-info@udel.edu).



Current Dashboards:



[Data Dictionary](#)

# Use Cases - Public Data: Tableau Public Dashboards

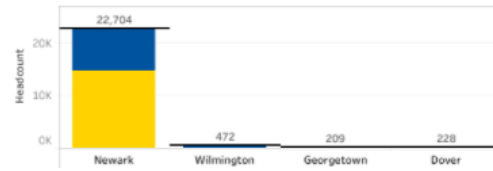
Enrollment Dashboard by [University of Delaware](#)



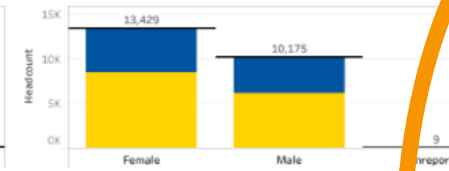
- Summary, Fall 2020
- TRENDS: Headcount by Gender & Residency
- TRENDS: Headcount by Campus & Residency
- TRENDS: Headcount by College of First Major
- TRENDS: Headcount by IPEDS Race/Ethnicity
- TRENDS: Headcount by IPEDS Race/Ethnicity
- TRENDS: Headcount by IPEDS Race/Ethnicity

## Summary Views, Fall 2020

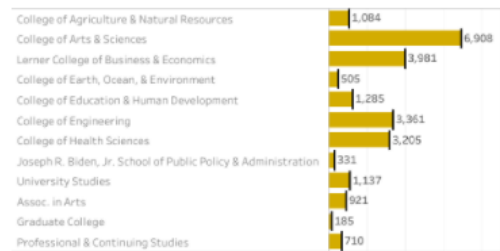
Headcount by Campus & Residency



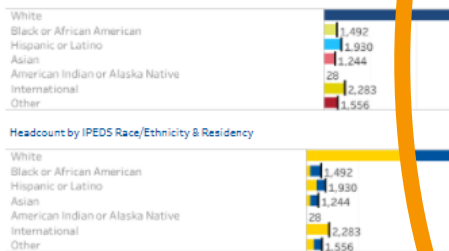
Headcount by Gender & Residency



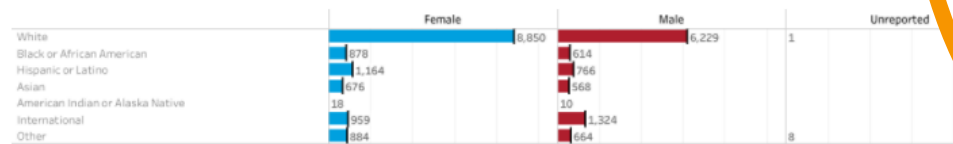
Headcount by College of First Major



Headcount by IPEDS Race/Ethnicity



Headcount by IPEDS Race/Ethnicity & Gender



University of Delaware Enrollment Dashboard Created: 8/25/2021 6:37:27 PM Data Freeze Date: 9/16/2020  
 Source: Official Enrollment Extract Contact ire-info@udel.edu with any questions.  
 Data Dictionary: <https://ire.udel.edu/dashboards/data-dictionary/>

Switch to Table View

Academic Load: (All)

Academic Level: (All)

Student Type: (All)

Residency: (All)

IPEDS Race/Ethnicity: (All)

Campus: (All)

Gender: (All)

College: (All)

Residency

Gender

College:

Residency

Gender

College:

Residency

Gender

College:



Switch to Table View

Academic Load:

(All)

Academic Level:

(All)

Student Type:

(All)

Residency:

(All)

IPEDS Race/Ethnicity:

(All)

Campus:

(All)

Gender:

(All)

College:

(All)

Residency

Delawareans

Nonresidents

Gender

Female

Male

Unreported



### Details

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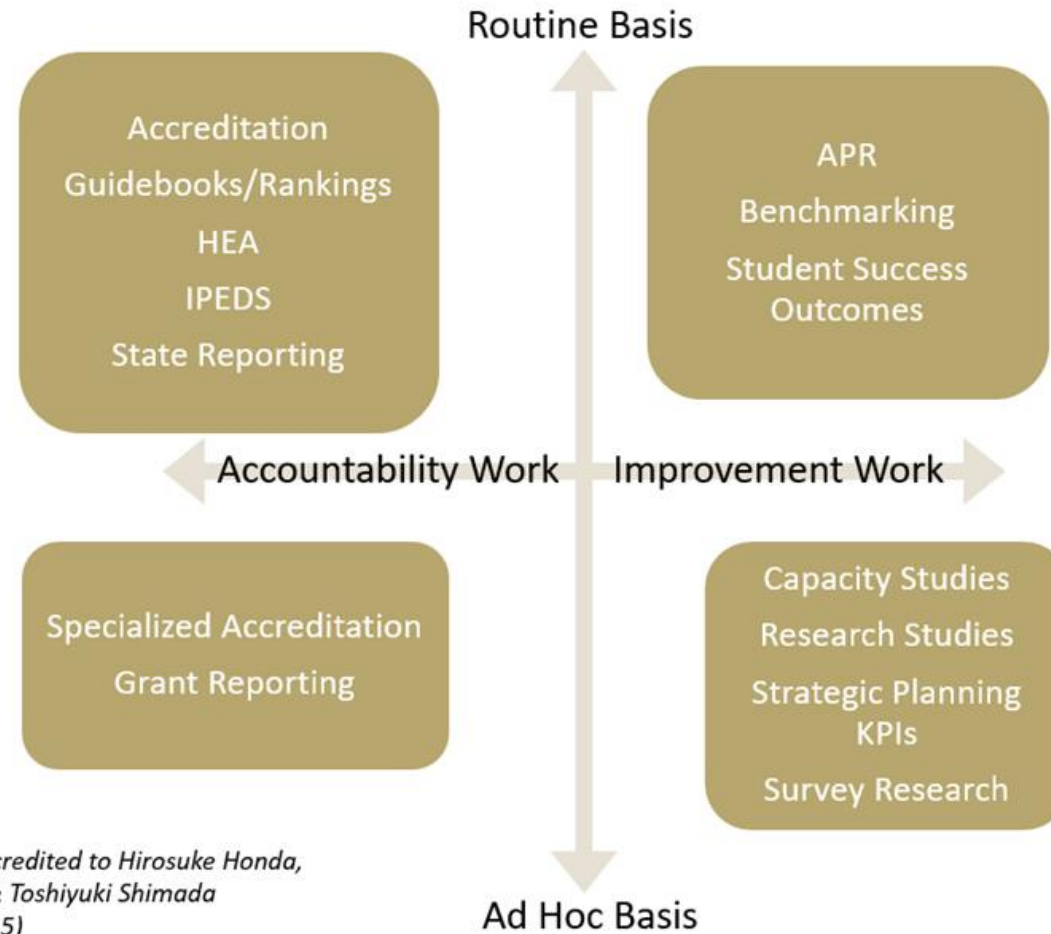
Enrollment Dashboard

Published: Aug 25, 2021 Updated: Sep 10, 2021

**How Do You Use This Same Data For  
Internal Operations & Decision Support?**



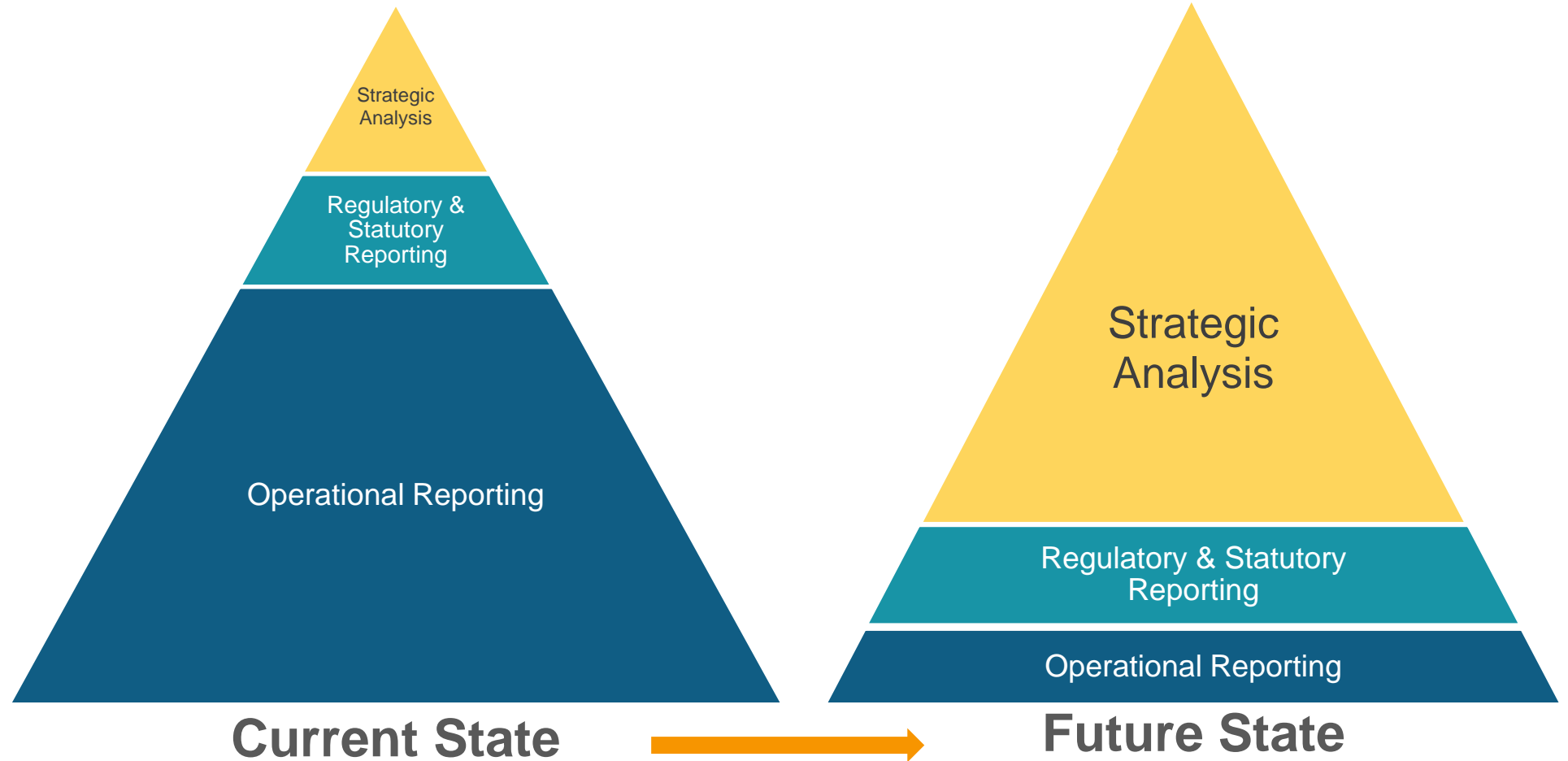
# Changing Role of IR



*Idea for matrix credited to Hirosuke Honda, Shigeru Asano, & Toshiyuki Shimada (AIR FOURM 2015)*



# Changing Role of IR



# Impact of COVID



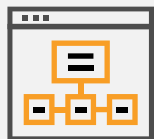
Accelerate need  
for decision  
support



Role of IR



Enrollment Data



Role of  
Data Models



Role of  
Security

# Data to Support Operations



## Net Tuition Revenue

### Daily Status Dashboard

*Live/operational - may not match official metrics.*

*Internal Use Only, Not for Publication*



Net Tuition Revenue - To Budget

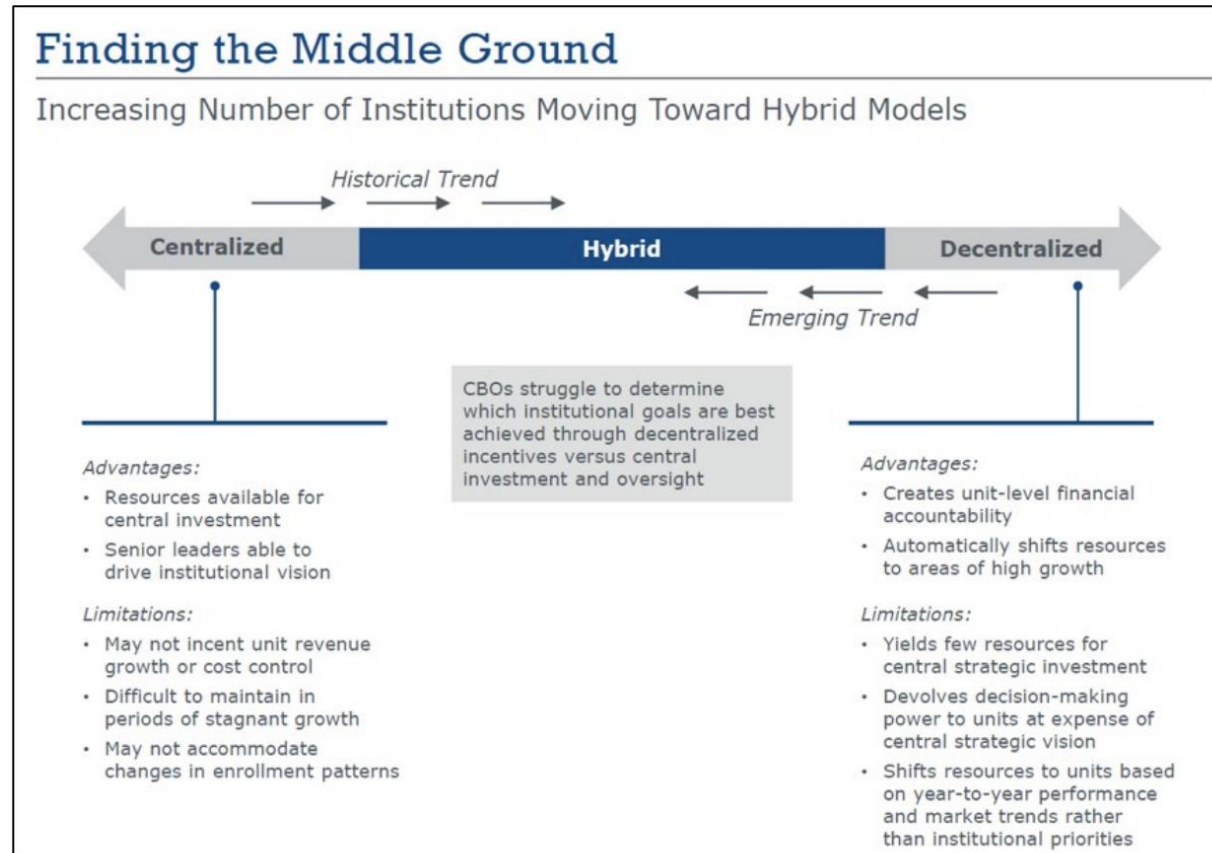
Net Tuition Factors	Aid Year 2021		
	Budgeted Amount	Amount	Percent of Budget
Undergraduate Tuition & Fees	\$	\$	%
Graduate Tuition & Fees			
Other Tuition & Fees			
Undergraduate Student A..			
Grad Contract/Scholarship/Aid			
Grand Total			

2020 Net Tuition as a % of Total

Net Tuition Factors	Aid Year / Term Type 2020			
	Fall	Spring	Summer	Winter
Undergraduate Tuition & Fees	%	%	%	%
Graduate Tuition & Fees				
Other Tuition & Fees				
Undergraduate Student Aid				
Grad Contract/Scholarship/Aid				
Grand Total				

# Data to Support Operations - Budgeting

Figure 1.1. Movement toward a hybrid budgeting model.



Source: EAB (2016).

CBOs = college business officers.

# Data to Support Operations - Budgeting

Figure 1.2.b. Summary of UD's budget model in its eventual phase

Predictable Base	Formulaic Fund Allocations (Based on Metrics)				Contractual Obligation Fund	Differential Fees
	Undergraduate Incremental Revenue	Graduate Incremental Revenue	Special Sessions Revenue	F&A Incremental Revenue		
Fiscal Year 2017 Actuals	<i>Allocation</i> <ul style="list-style-type: none"> <li>• Student head count by major (25%)</li> <li>• IDOR (75%)</li> </ul> + <i>Distribution</i> <ul style="list-style-type: none"> <li>• College (50%)</li> <li>• Contractual Obligation Fund (50%)</li> </ul>	<i>Allocation</i> <ul style="list-style-type: none"> <li>• IDOR (50%)</li> <li>• Subject by course ownership (50%)</li> </ul> <i>Distribution</i> <ul style="list-style-type: none"> <li>• College (25%)</li> <li>• Department (12.5%)</li> <li>• Program (12.5%)</li> <li>• Contractual Obligation Fund (50%)</li> </ul>	<i>Allocation</i> <ul style="list-style-type: none"> <li>• IDOR (100%)</li> </ul> <i>Distribution</i> <ul style="list-style-type: none"> <li>• College (25%)</li> <li>• Department (25%)</li> <li>• Contractual Obligation Fund (50%)</li> </ul>	<i>Distribution</i> <ul style="list-style-type: none"> <li>• Principal investigators (5%)</li> </ul> Remaining 95% distributed to: <ul style="list-style-type: none"> <li>-- college/dept. (38%/9.5% respectively) OR UD-wide institute (47.5%)</li> <li>-- arts/humanities (2%)</li> <li>-- Contractual Obligation Fund (45.5%)</li> </ul>	Combination of formulaic allocation and one-time cash reserves	Will be fully implemented in FY 2021  Distributed 100% to the college

F&A = Facilities and Administrative; FY = fiscal year; IDOR = instructor department of record.

# What's Next?

- Improve Communication:
  - How do we engage university partners in this?
  - Communication at a large university is difficult so how can we do this better to build a data use community?



A woman with glasses, wearing a dark sleeveless top, stands at the front of a meeting room, gesturing with her hands as if presenting. She is holding a small object in her right hand. The room has a brick wall and a whiteboard. Several people are seated at desks in the foreground, looking towards the presenter. One man is looking at a laptop, and another is looking at a whiteboard. The entire image is overlaid with a semi-transparent orange filter.

Questions?

**Thank you**

HelioCAMPUS

