Guided Pathways to Success in Kentucky

Greg Heileman
Associate Provost

University of Kentucky

What is the Purpose of Analytics?

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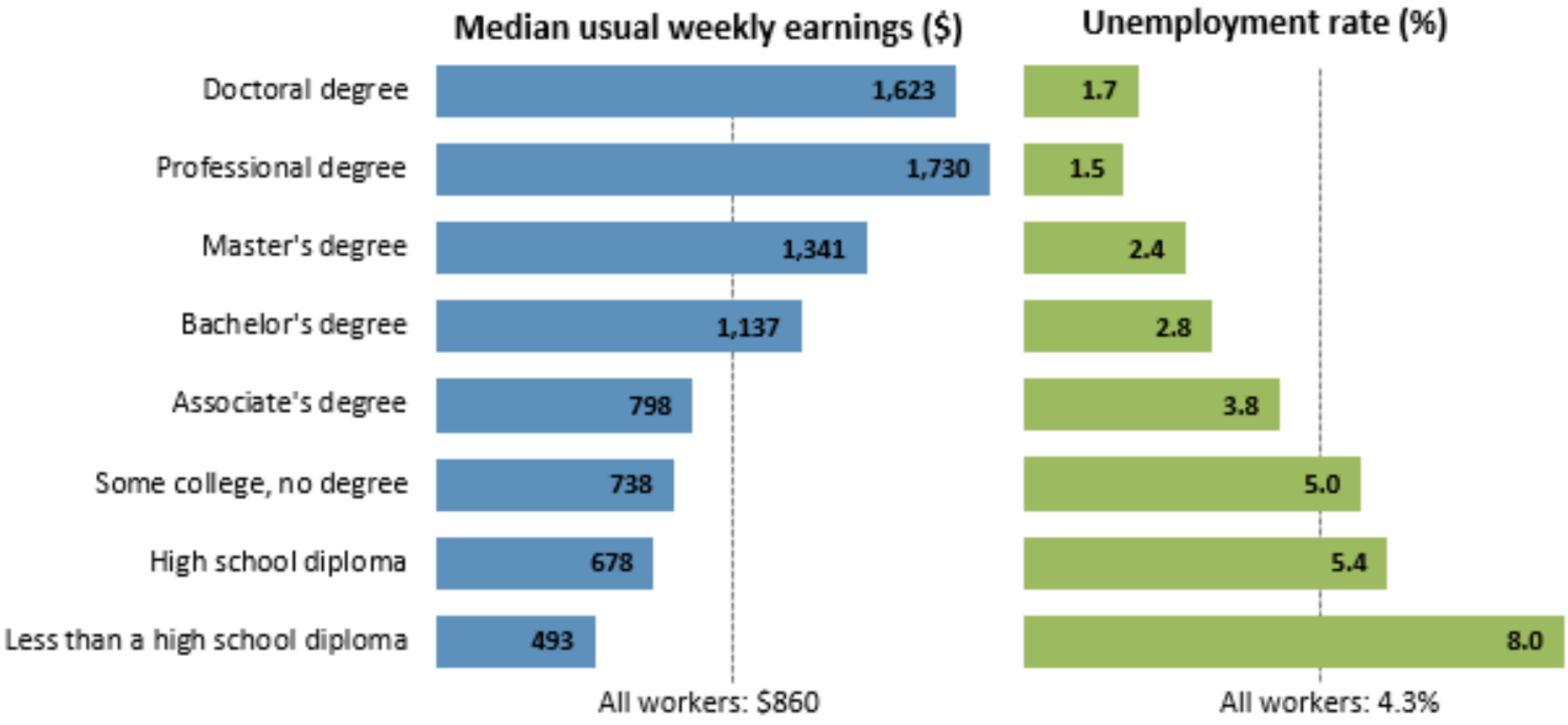
Takeaway #1: Analytics is Storytelling

Higher Education in America

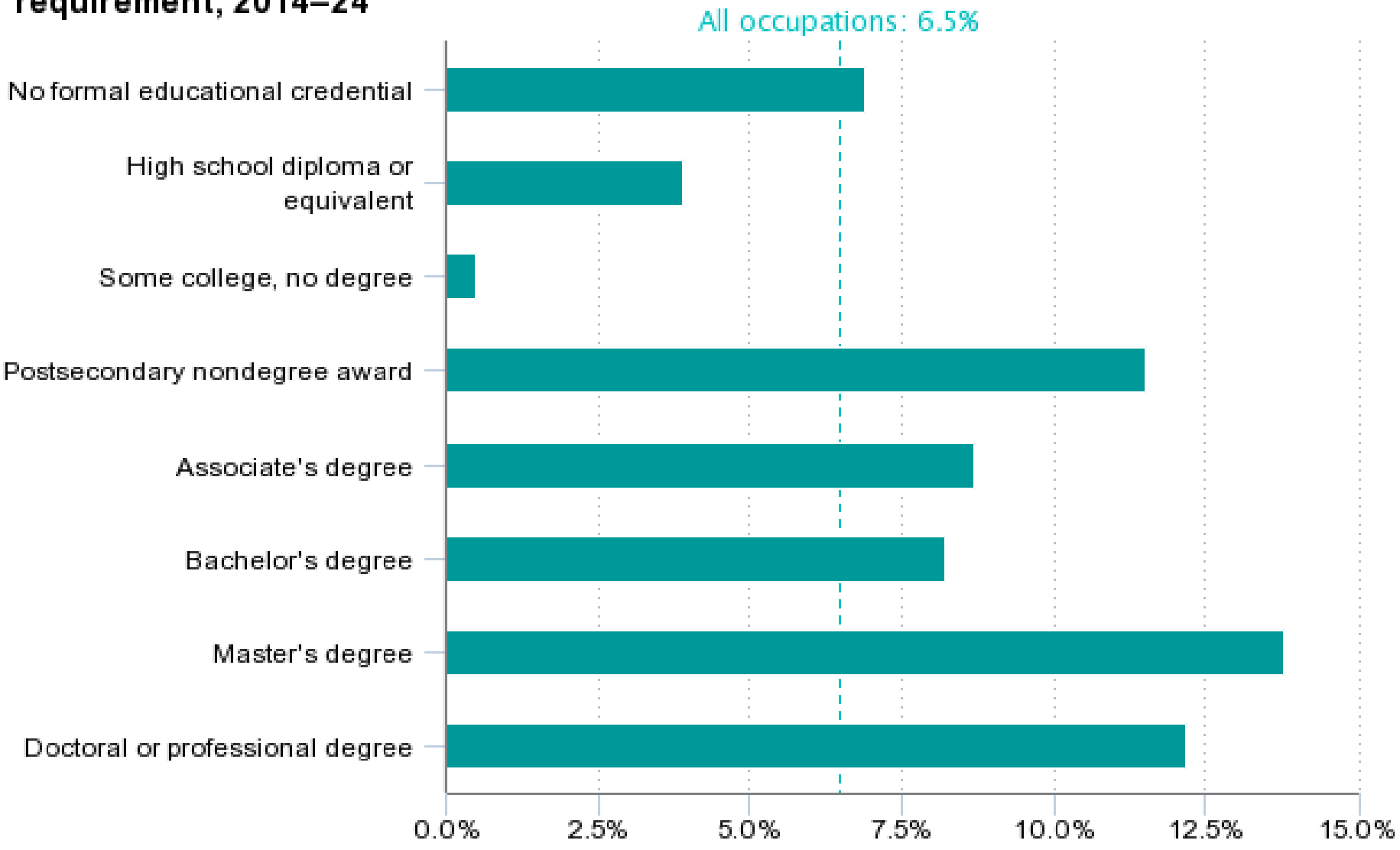
Earnings and unemployment rates by educational attainment, 2015



Note: Data are for persons age 25 and over. Earnings are for full-time wage and salary workers.

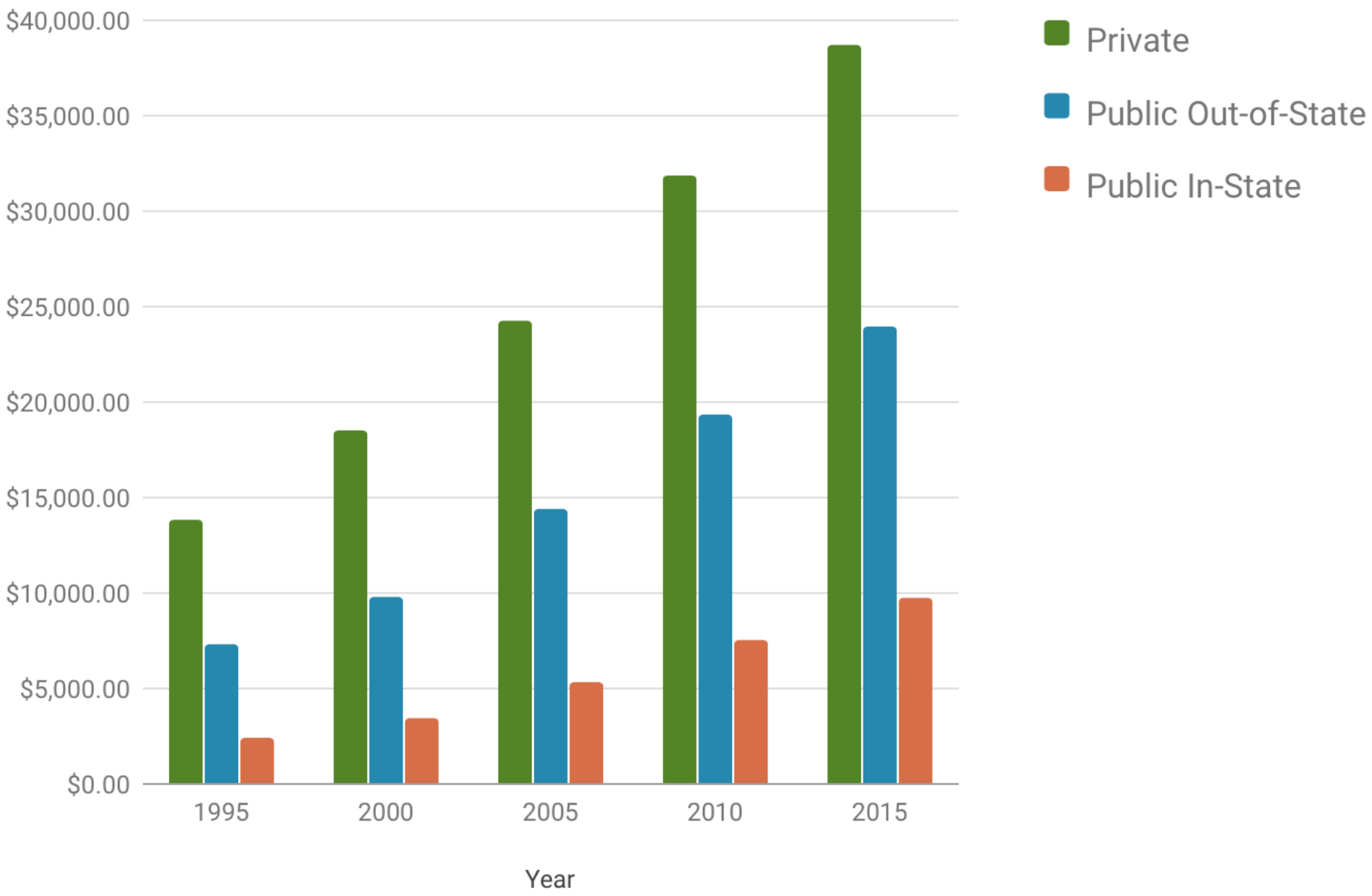
Source: U.S. Bureau of Labor Statistics, Current Population Survey

Projected percentage change in employment by typical entry-level educational requirement, 2014–24



Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.

Cost of Higher Education



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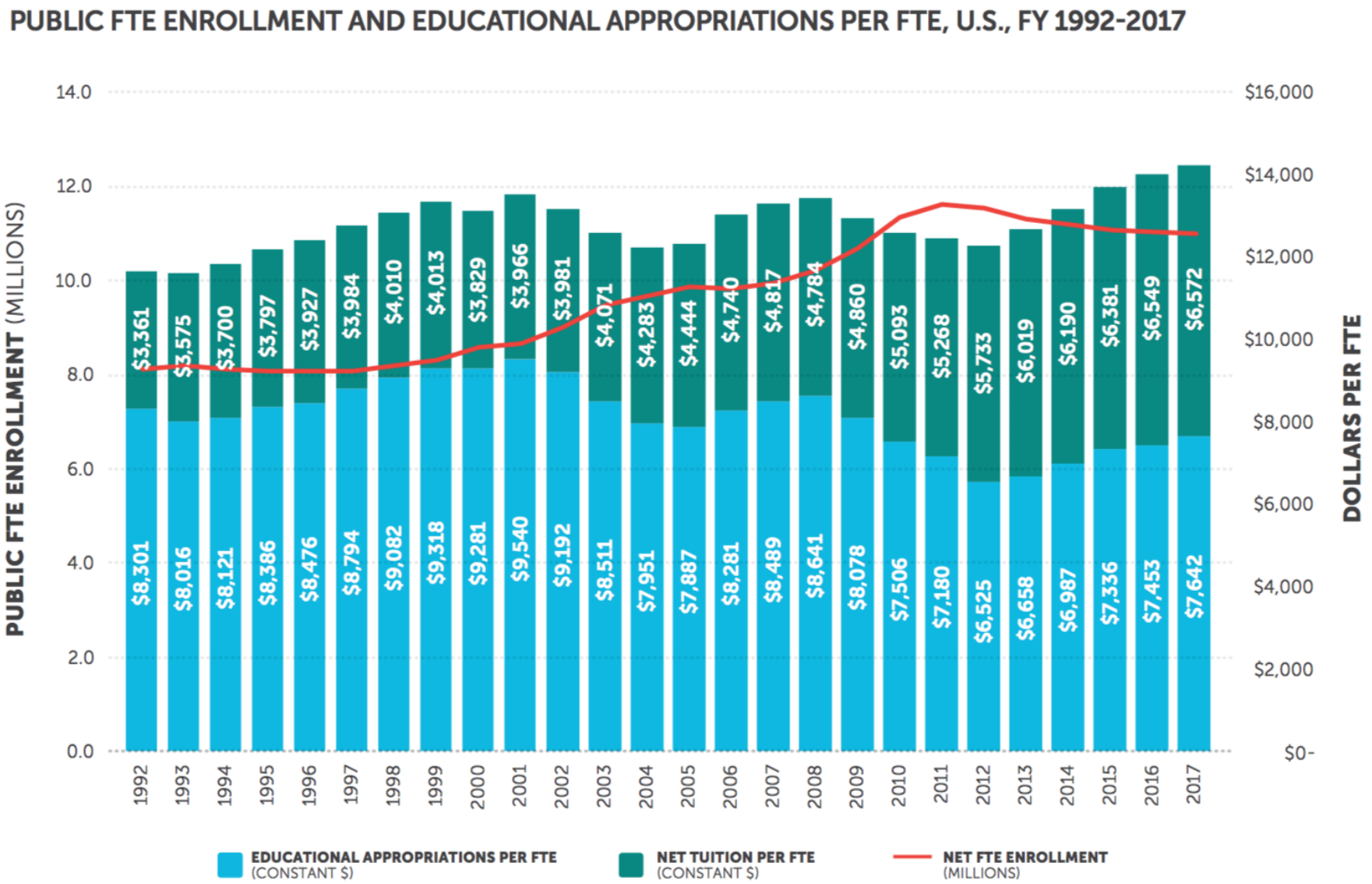
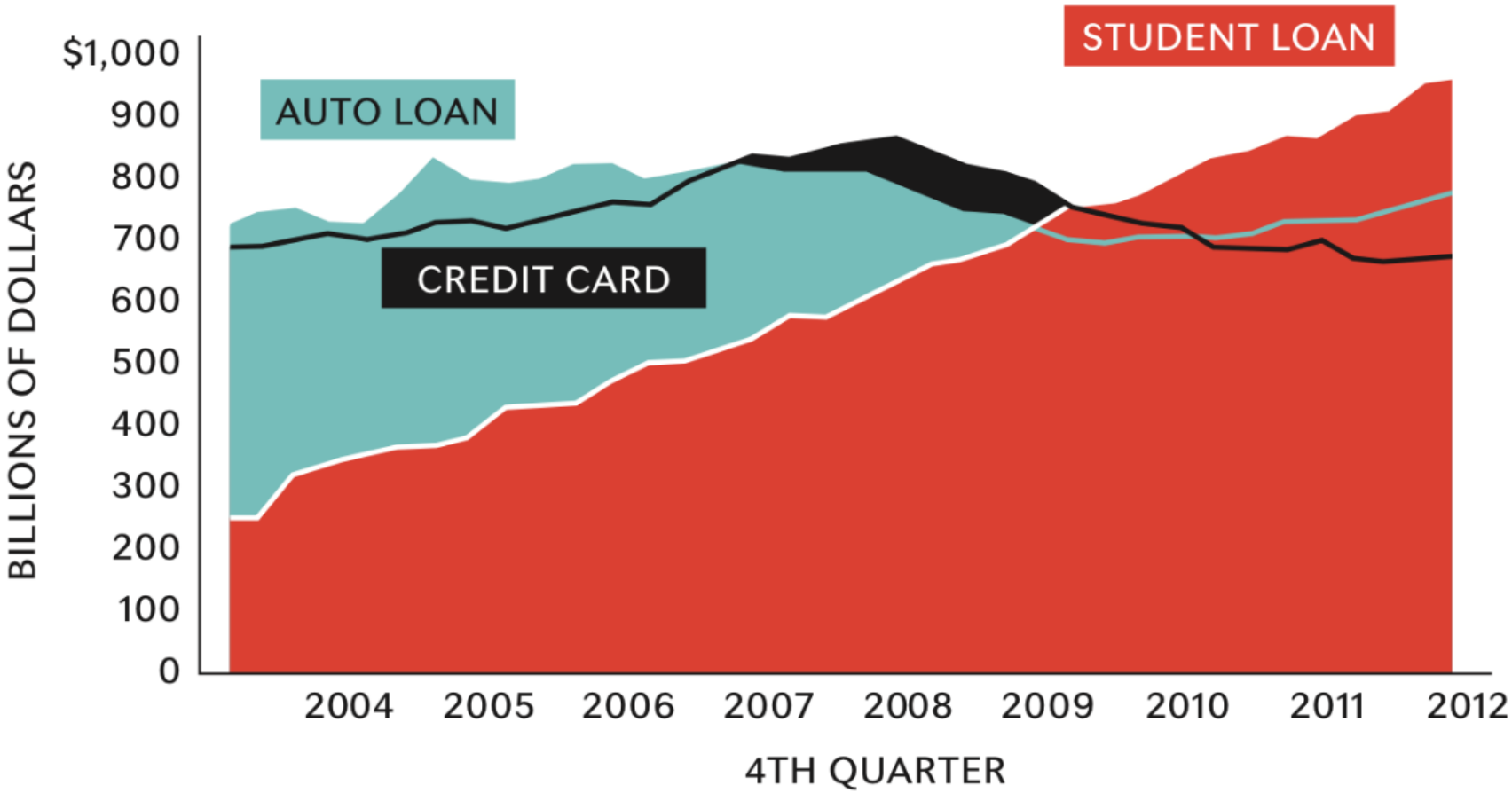
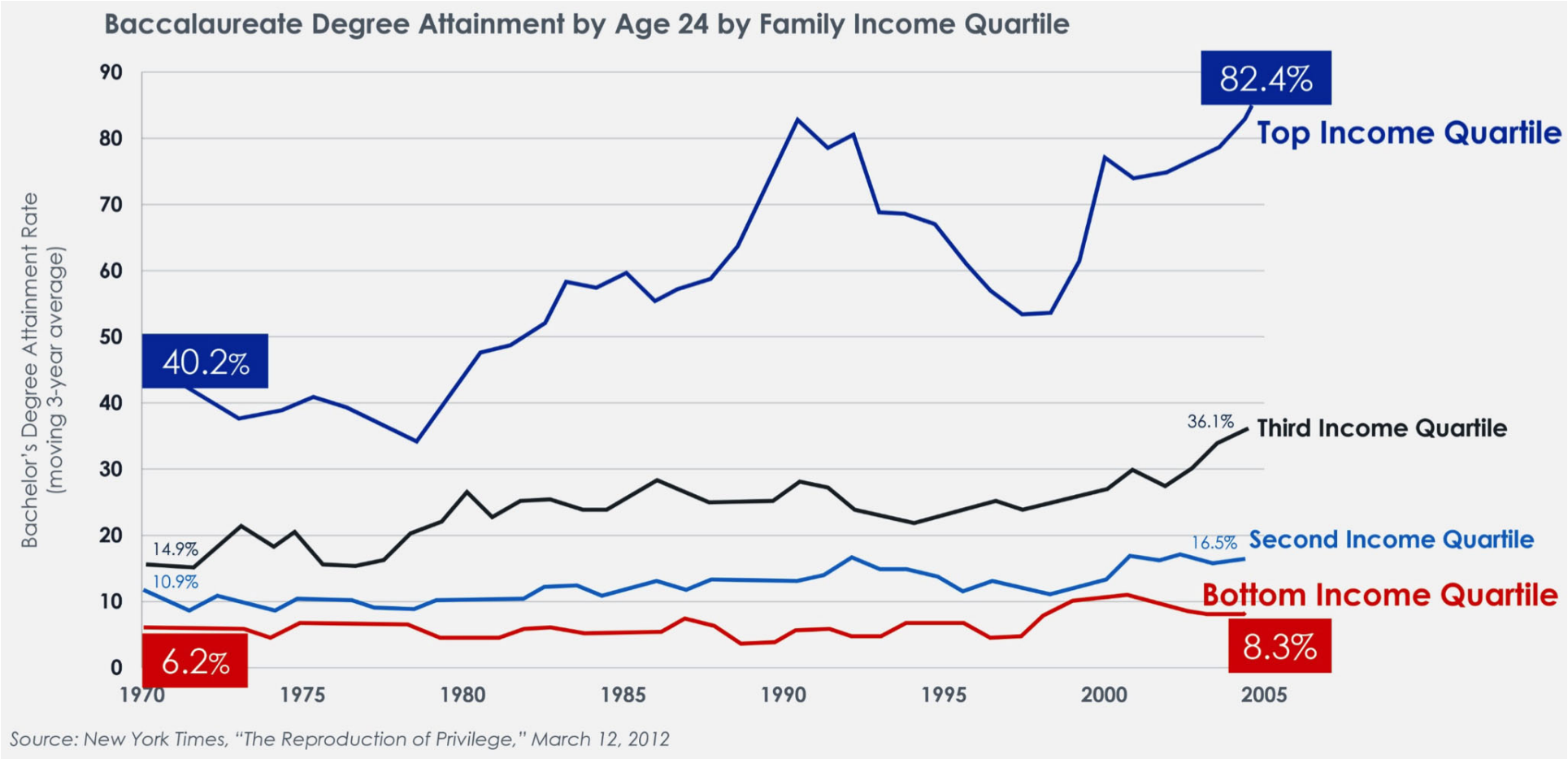


U.S. Personal Debt



Source: Federal Reserve Bank of New York

Attainment Gap

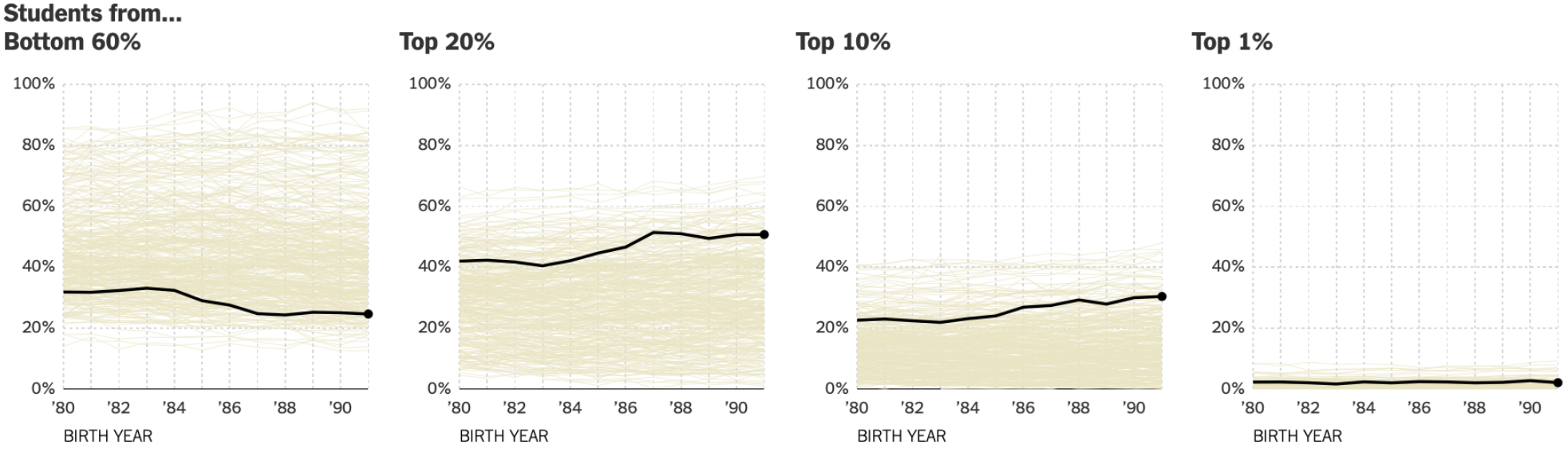


Source: New York Times, "The Reproduction of Privilege," March 12, 2012

Who We Serve

How access at University of Kentucky has changed

Peer schools are shown in yellow



Source: The Equality of Opportunity Project

Who We Serve

How access at University of Louisville has changed

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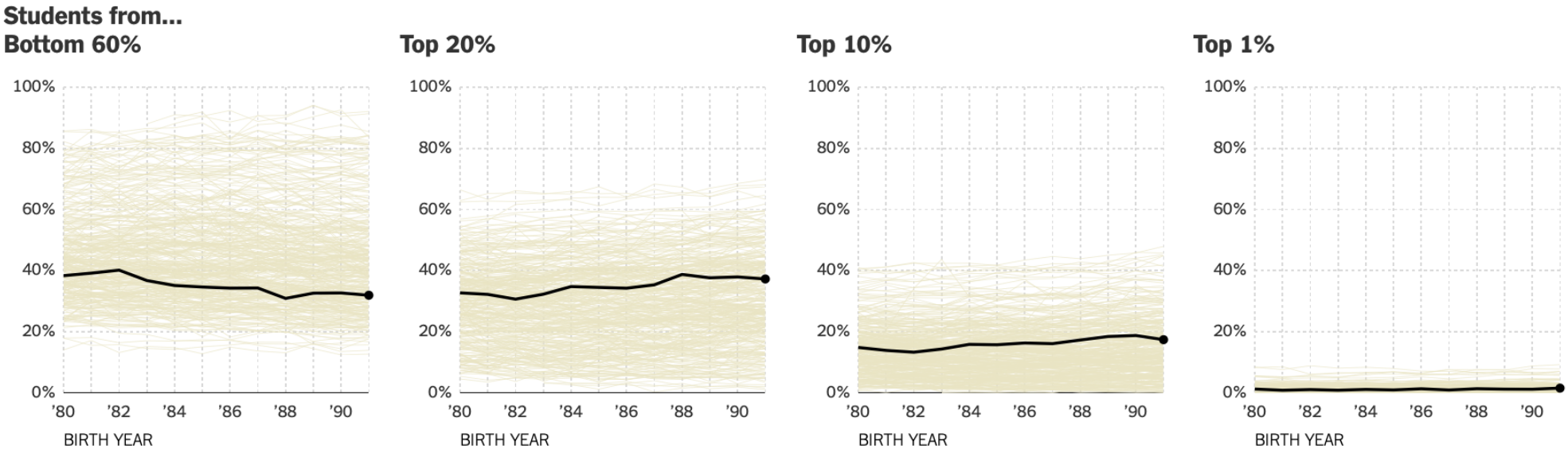
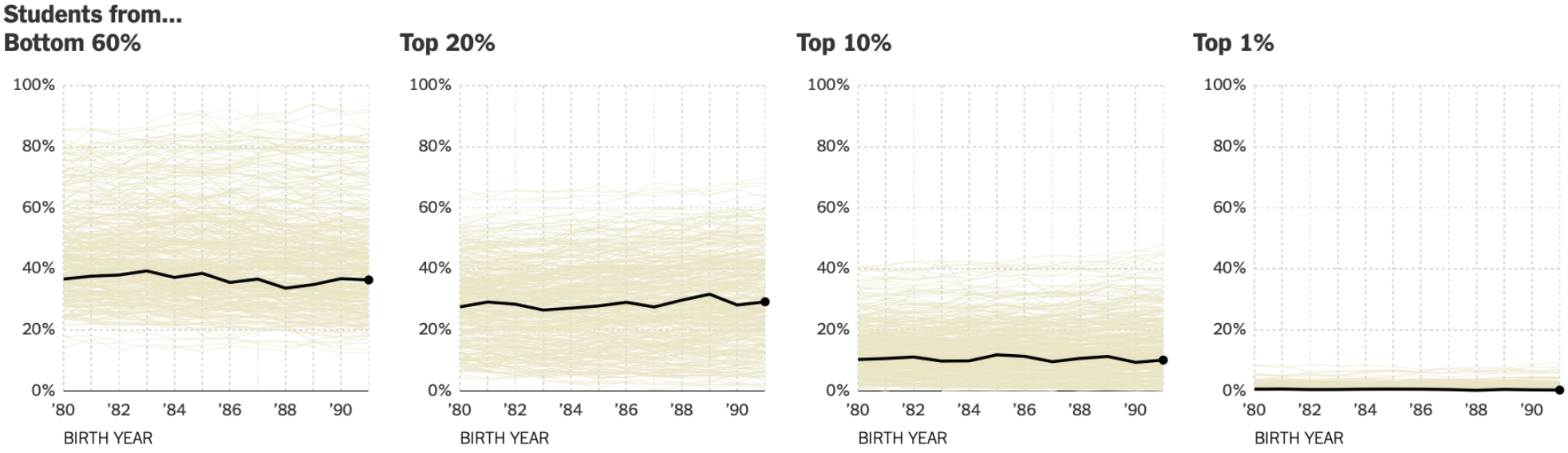


Source: The Equality of Opportunity Project

Who We Serve

How access at Northern Kentucky has changed

Peer schools are shown in yellow



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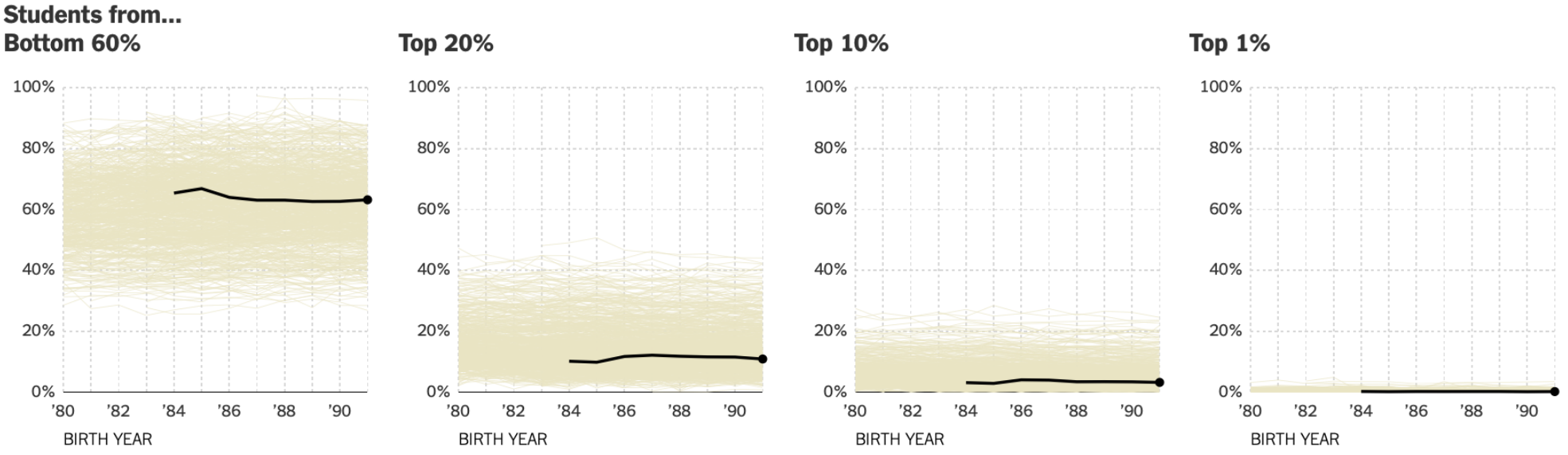
Who We Serve

How access at Kentucky Community and Technical College System has changed

Peer schools are shown in yellow



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Who We Serve

How access at Harvard has changed

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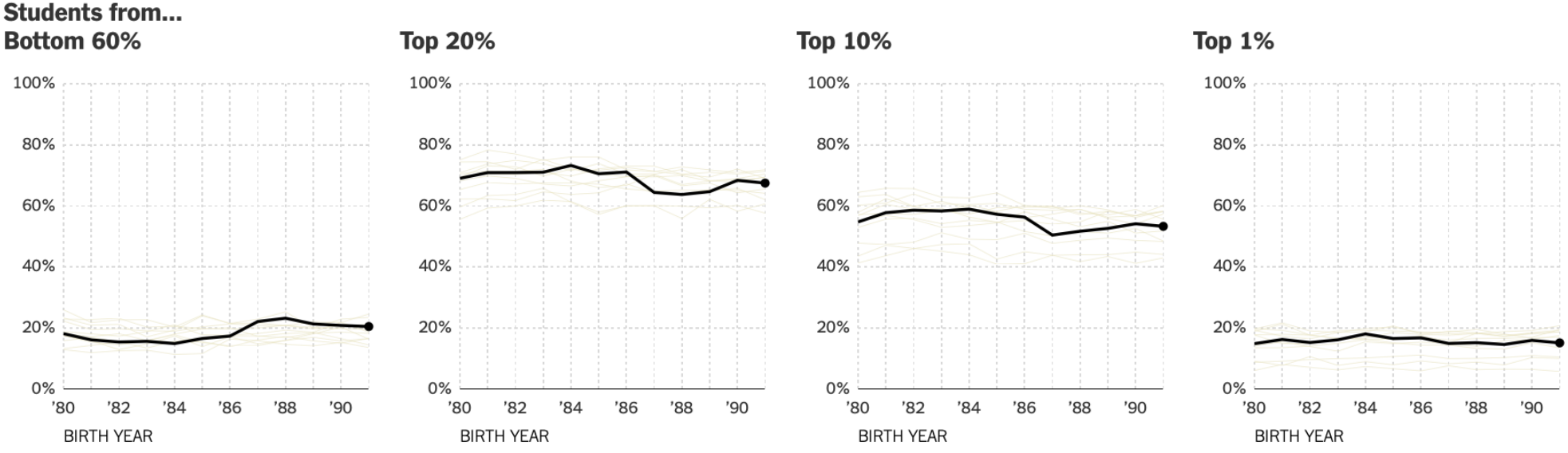

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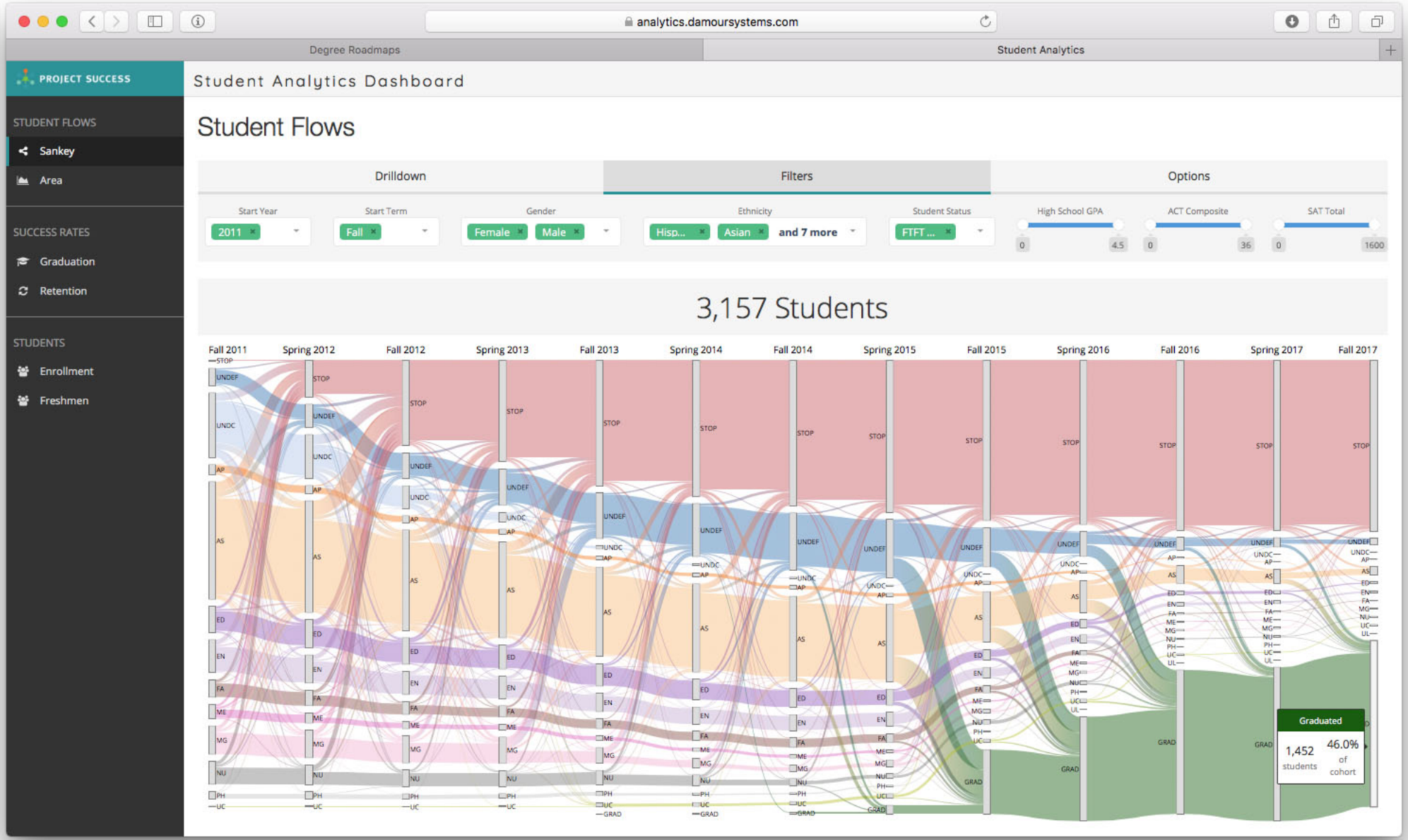
Storytelling



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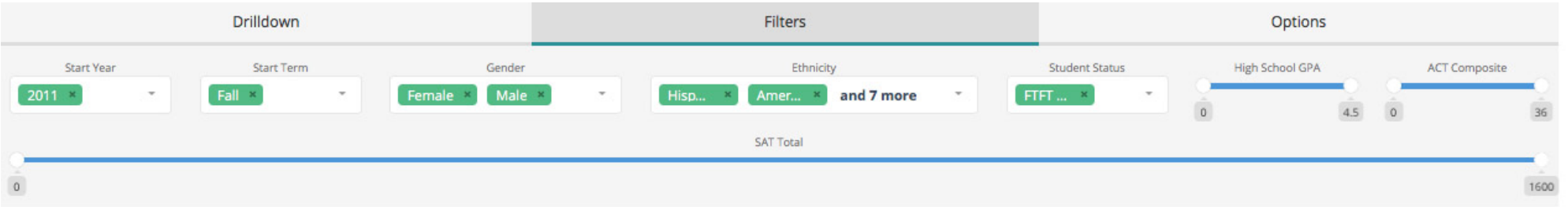

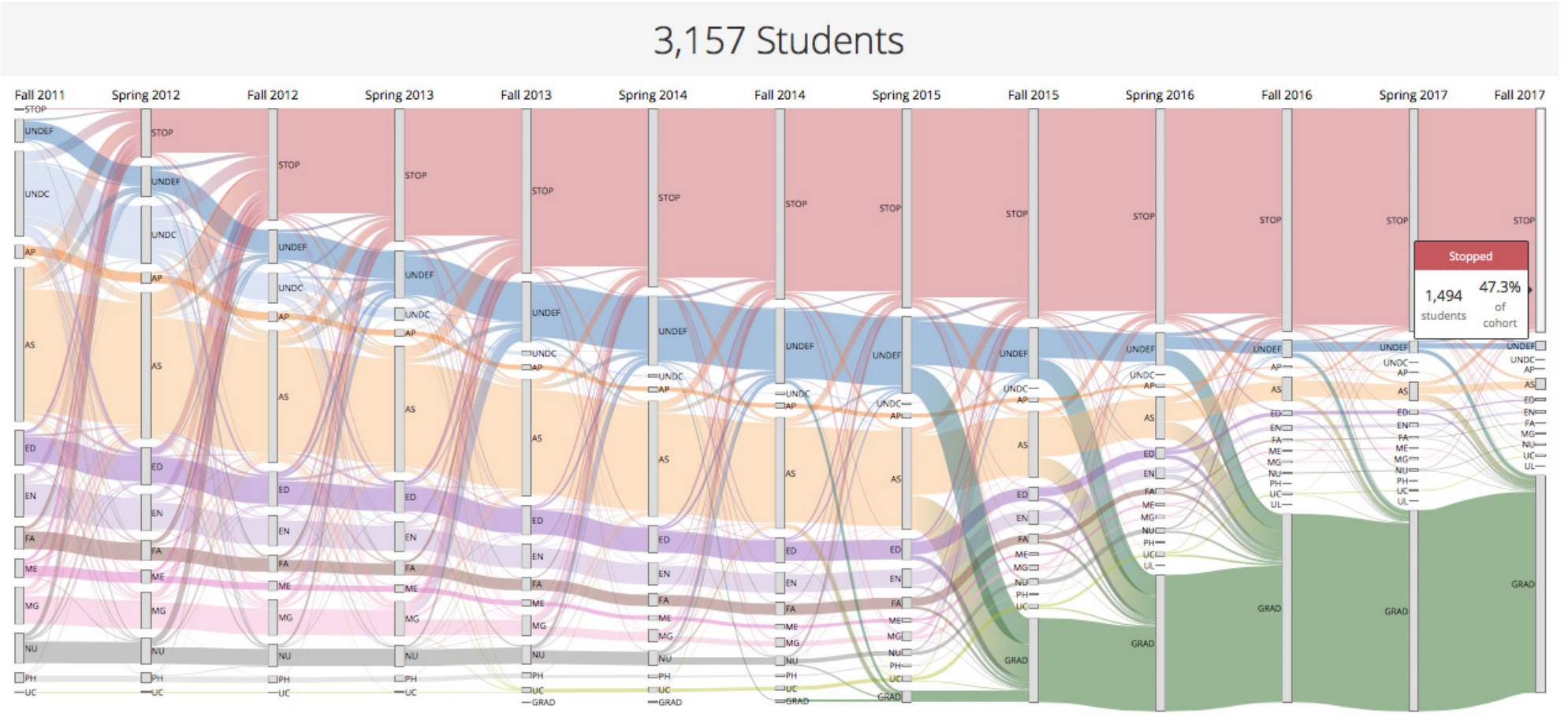

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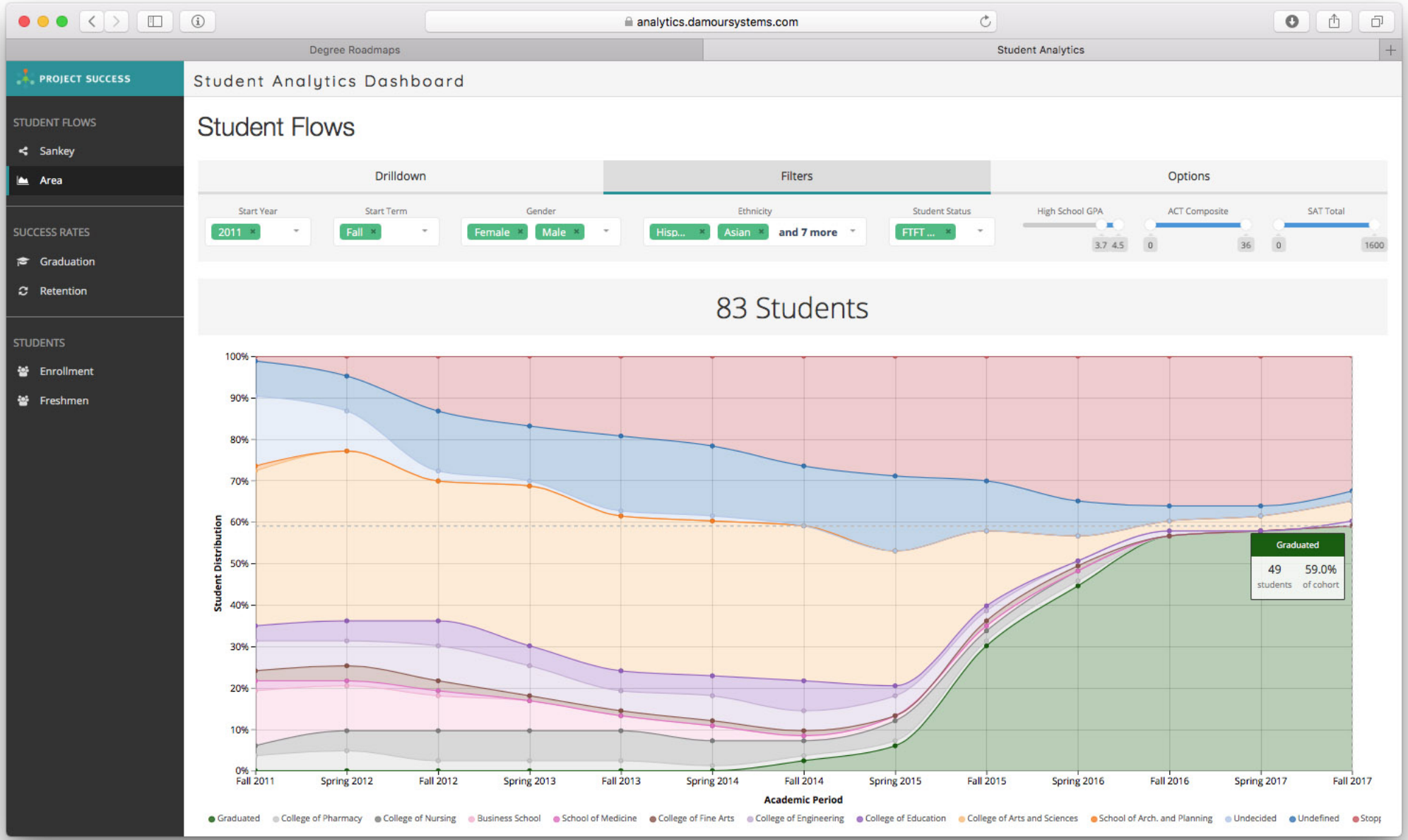

Our Story

Higher Education's Task:

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Pressures to: **Replicate the success of others**

Analytics Stampede

How many of you have been here?

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Big State University Improves Graduation Rates by Training Advisors as Mimes!

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Why didn't we think of this!

Know Thyself

Know Thyself

- Student success depends on local conditions ... what works at one place may not work at another.

?
STRATEGY =
TAKE THE RIVER
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X
©RICH GOUDEL

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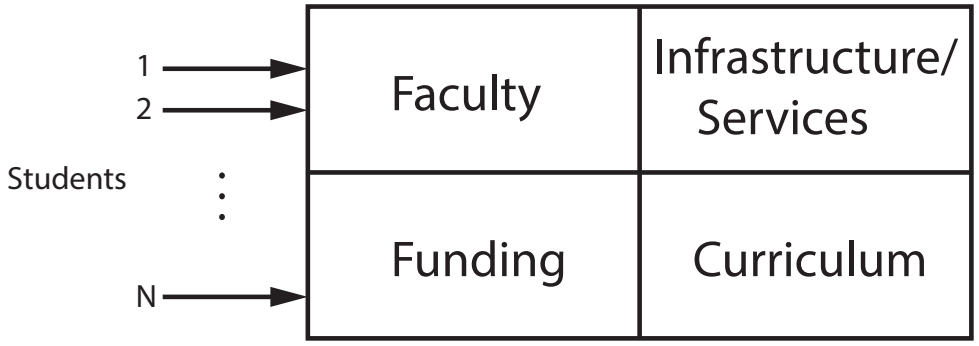
Takeaway #2: Analytics should inform strategies and tactics, not initiate them

Student Success – Improvement Framework

Faculty	Infrastructure/ Services
Funding	Curriculum

- The university as an interconnected **system**.

Student Success – Improvement Framework



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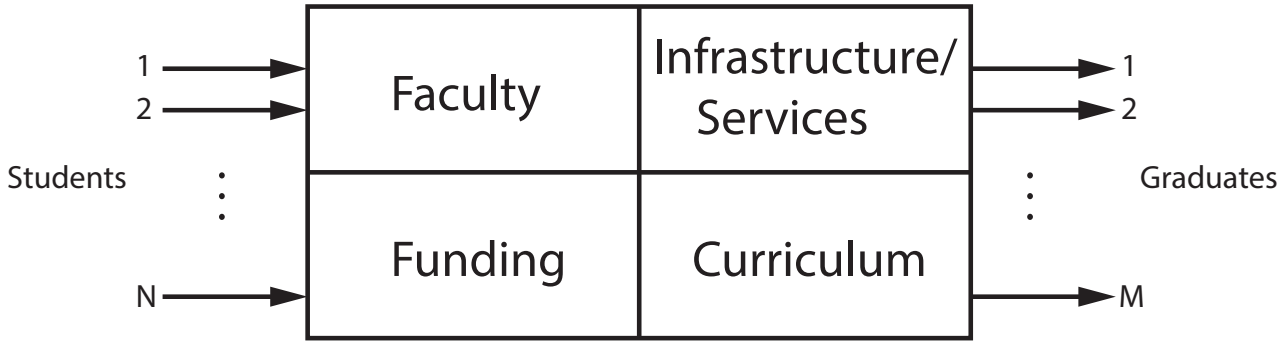

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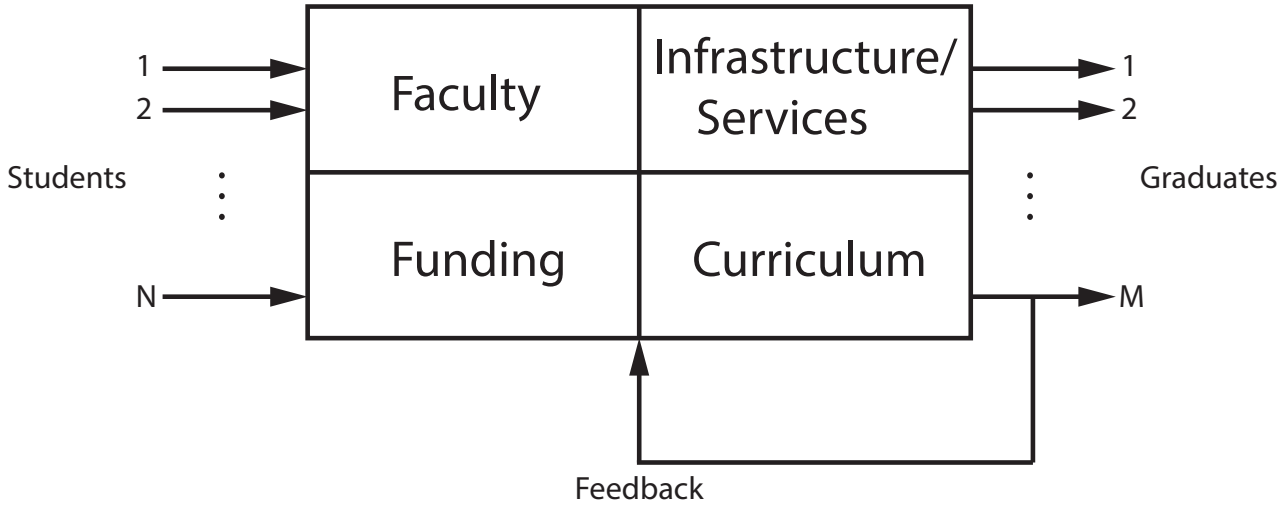

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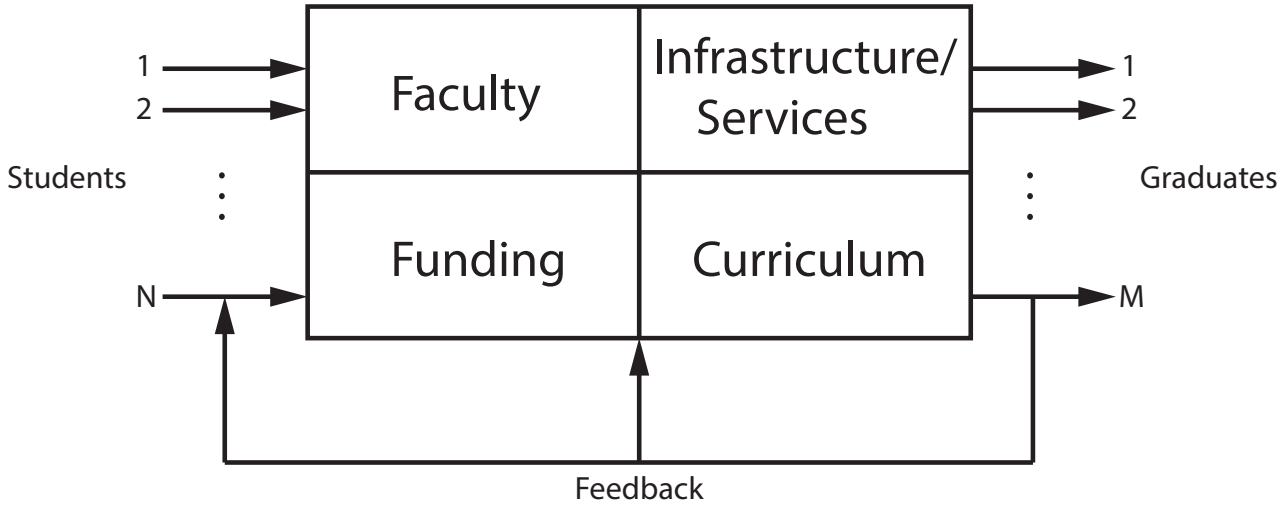

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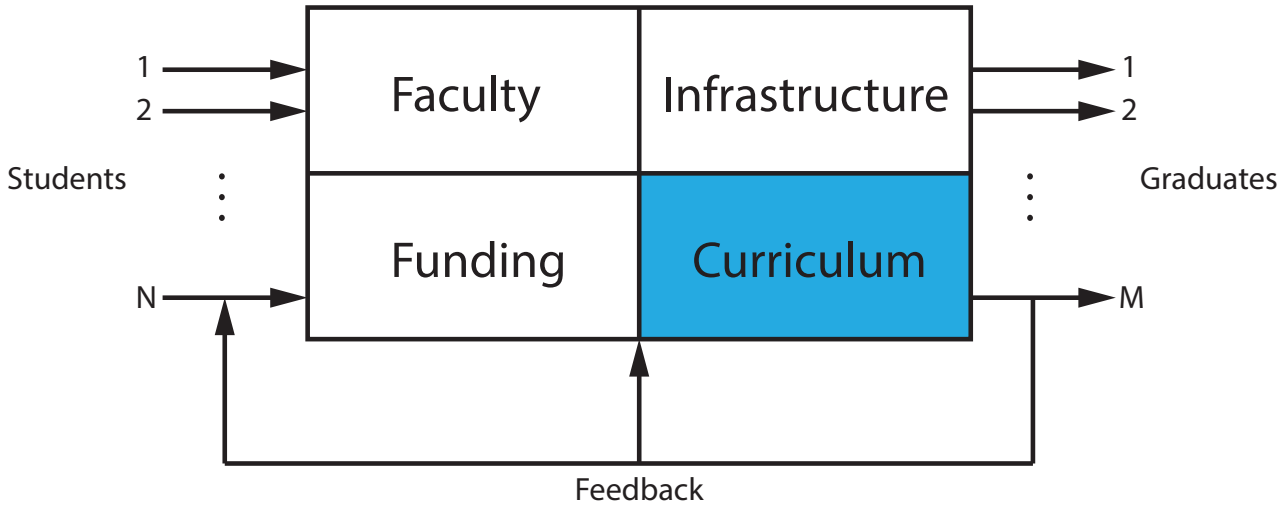

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- In this talk we'll focus on the **curriculum** piece of the system.

Analytics Maturity

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Takeaway #3: Analytics is a process, not a product

Analytics Workflow

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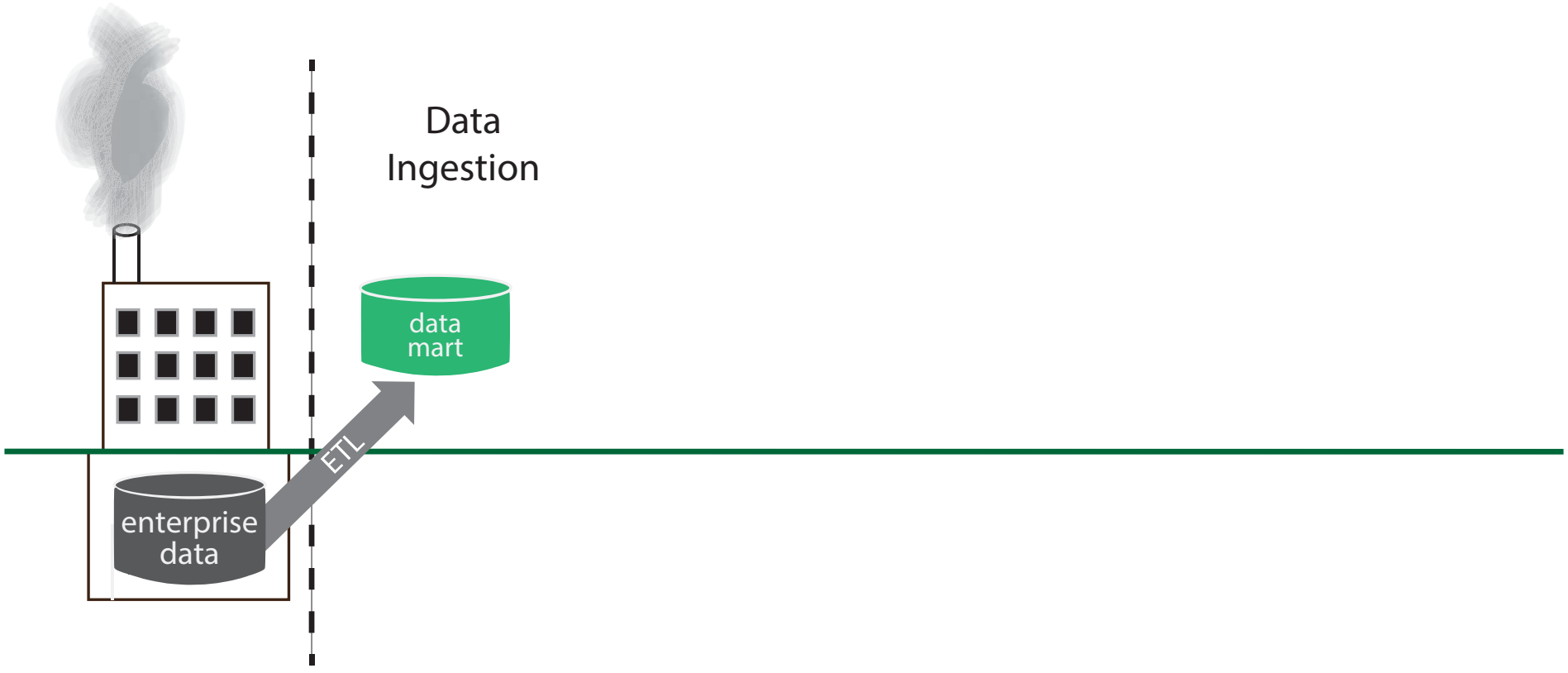

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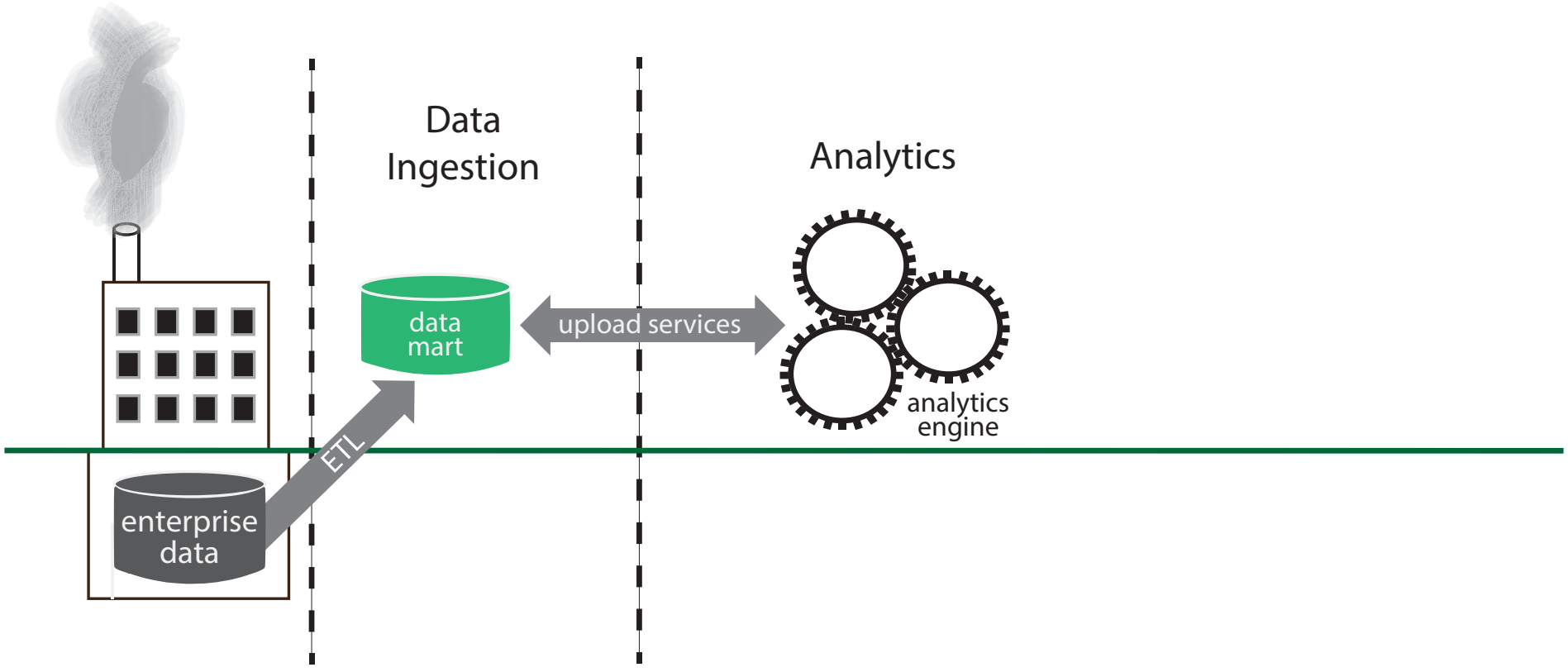

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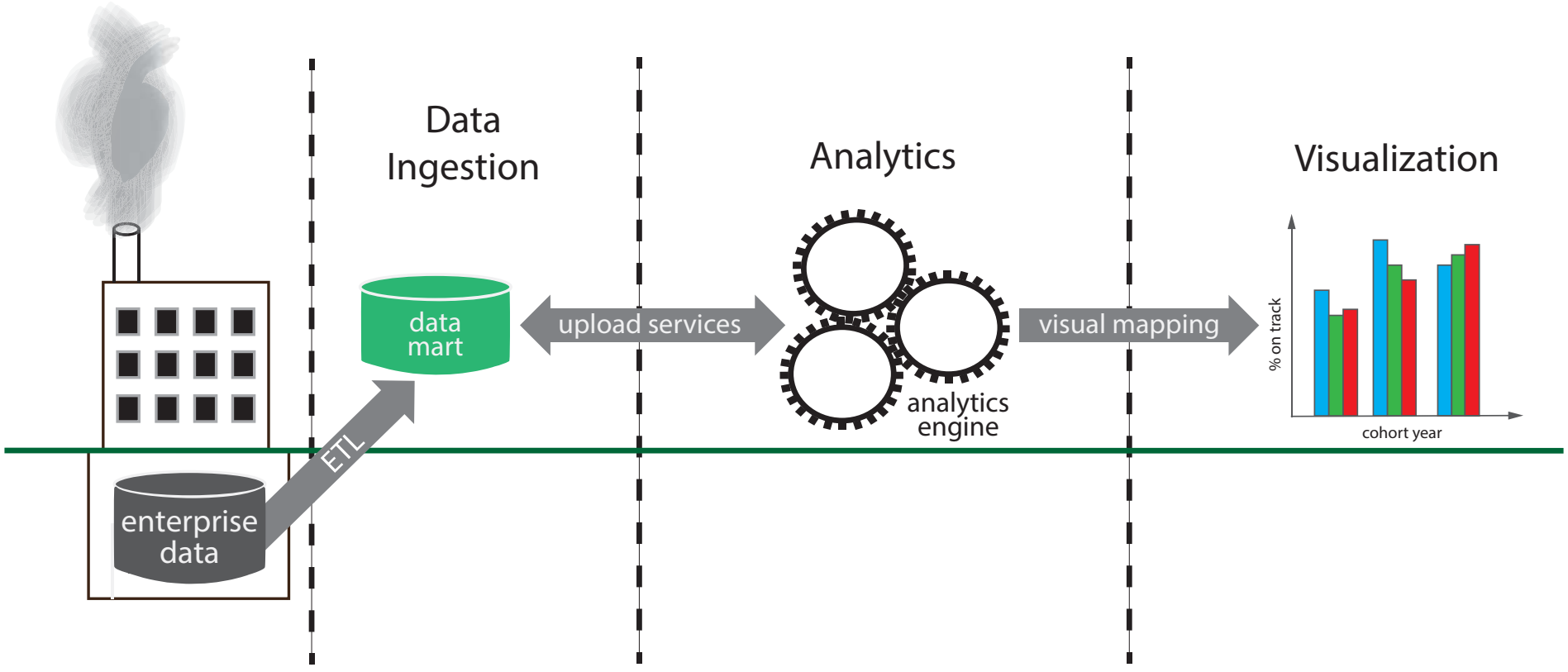
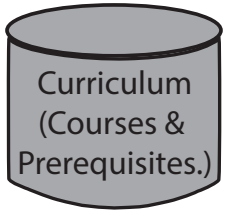


Curricula and Degree Plans



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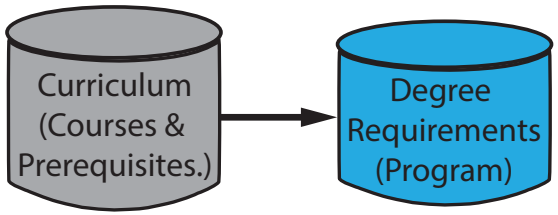

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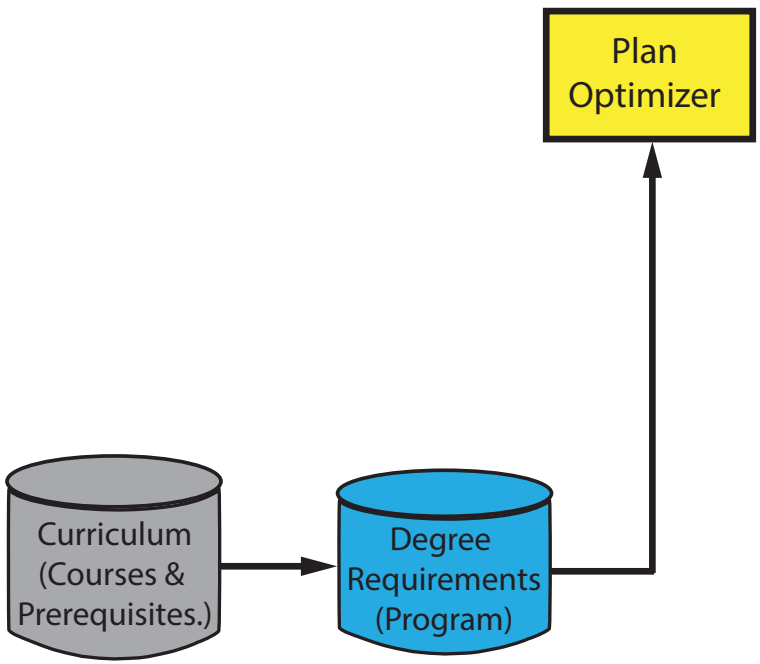

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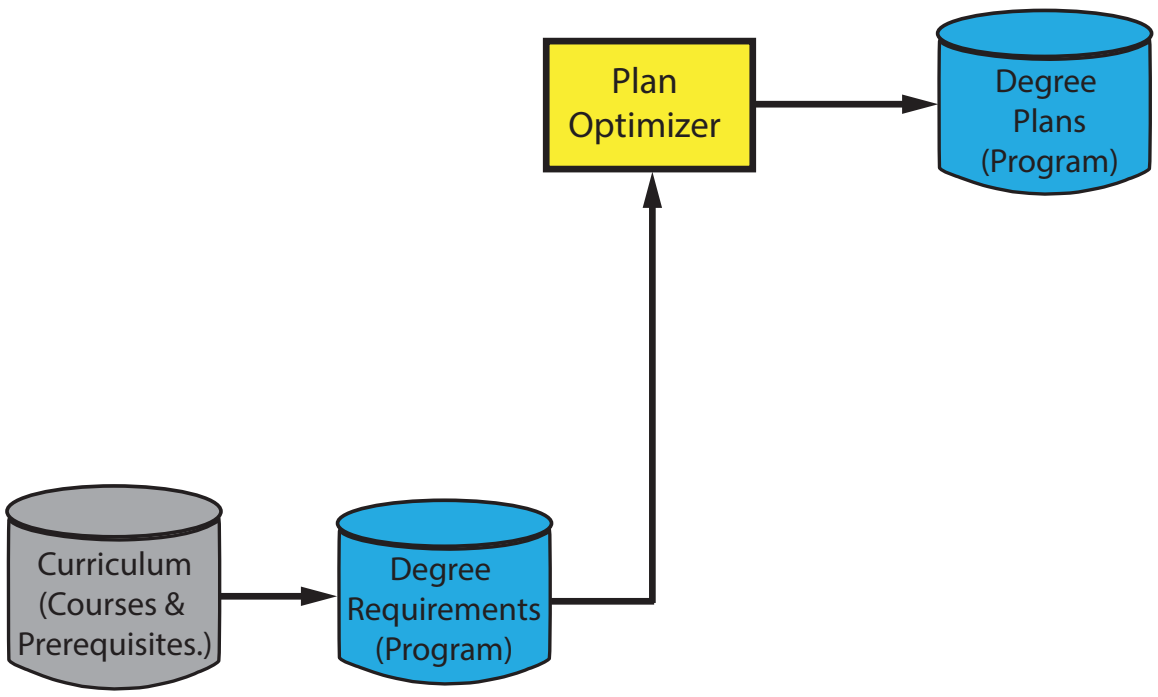

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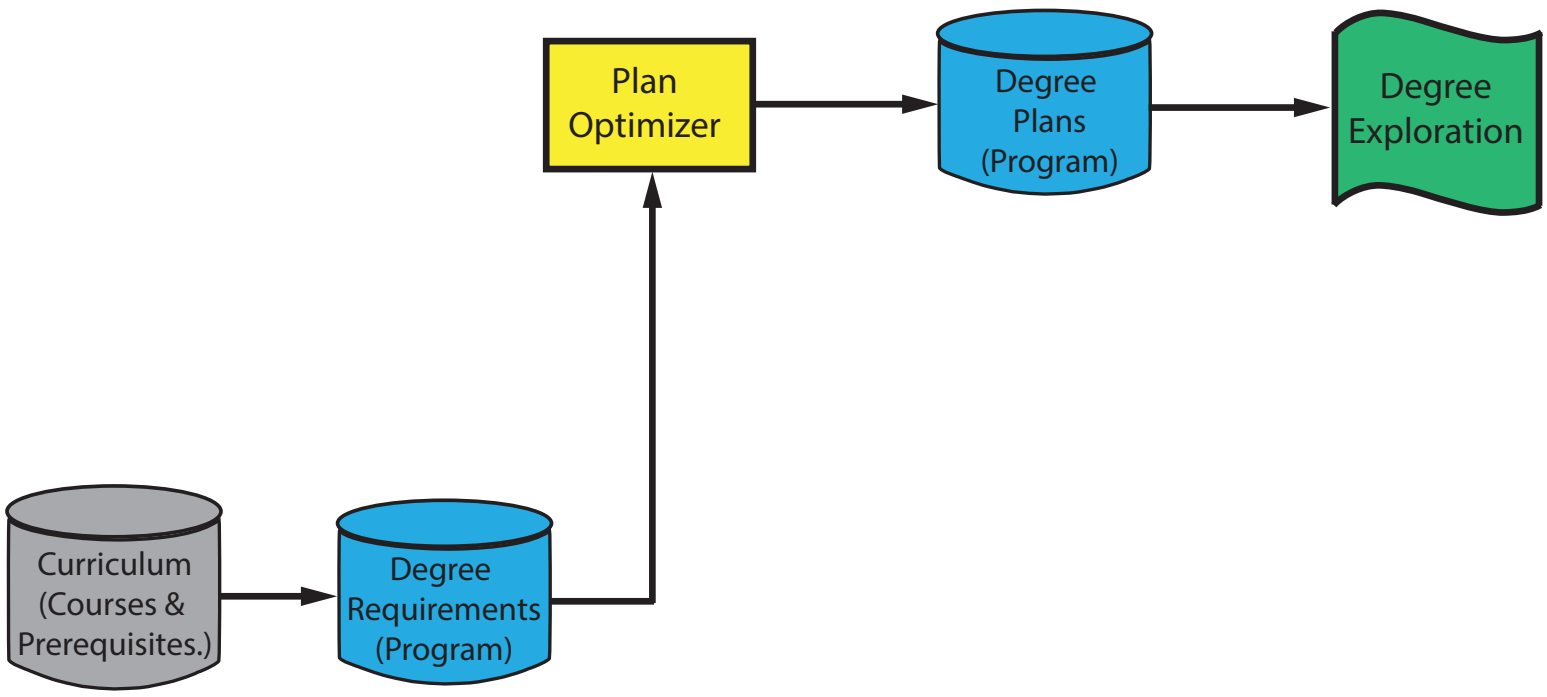

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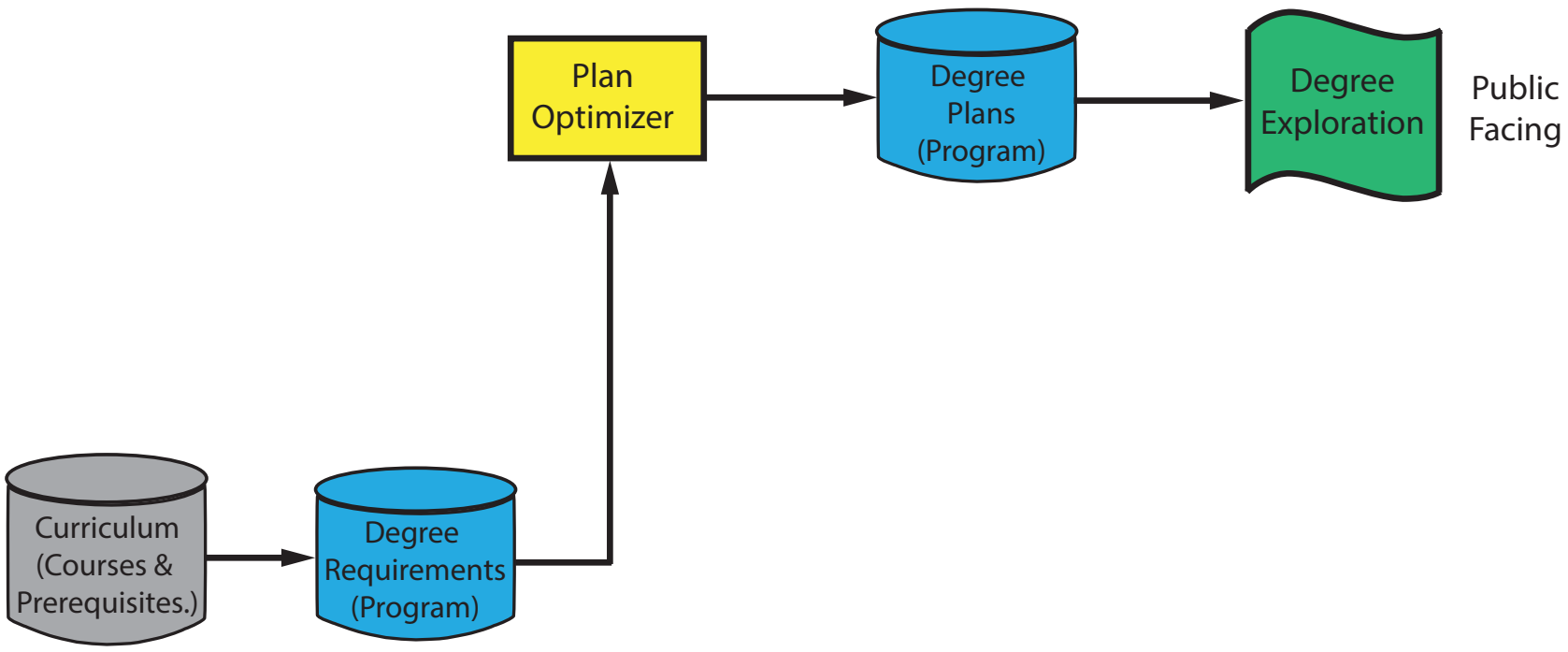
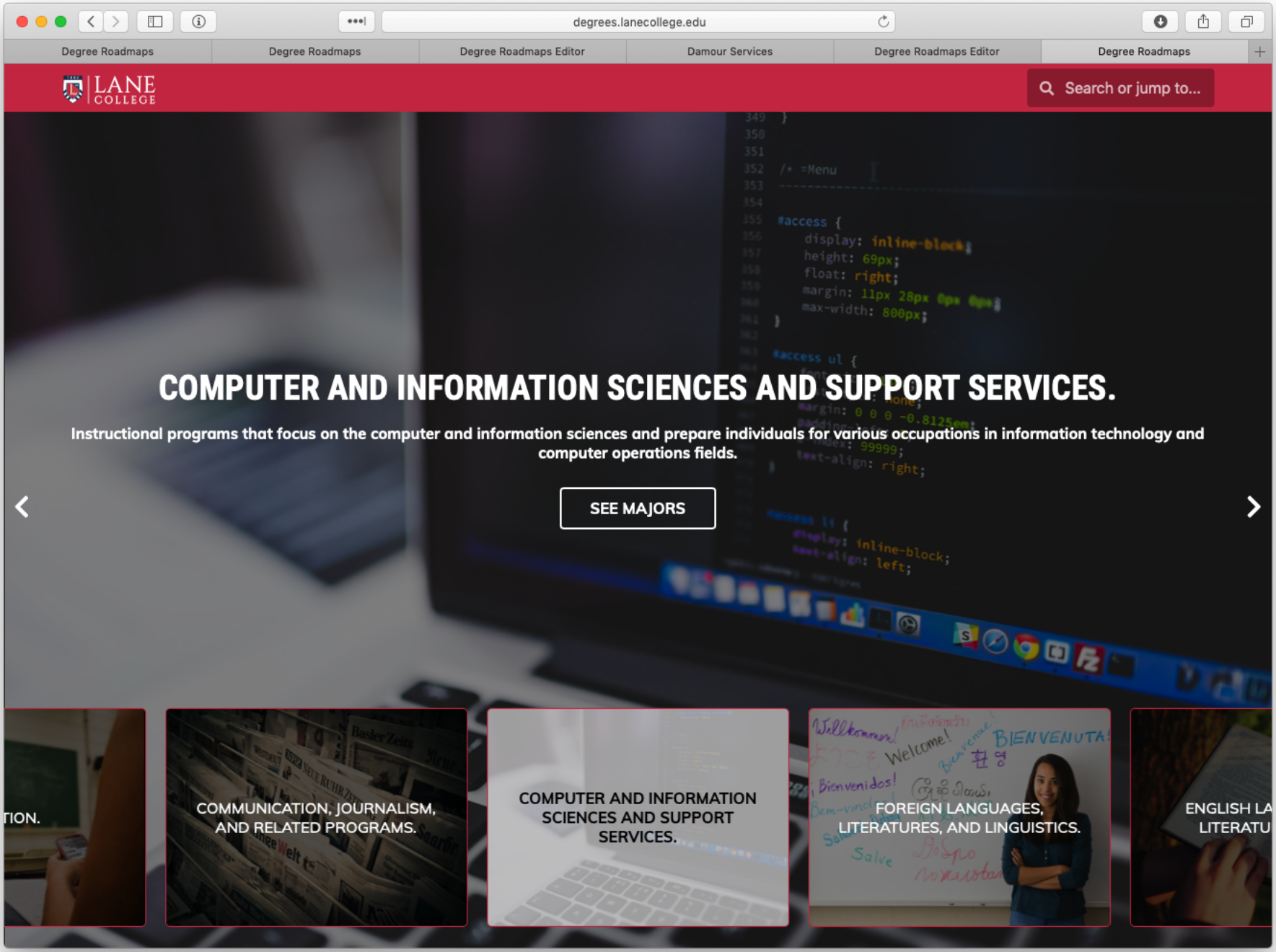


Degree Plans – Explore Careers



Degree Plans – Explore Careers

Career Opportunities:

With a degree in Mechanical Engineering from UNM, students are ready to:

- Work in robotics, manufacturing, aerospace, biotech, and more
- Develop alternative energy resources
- Design aircraft and automotive vehicles
- Conduct atmospheric research

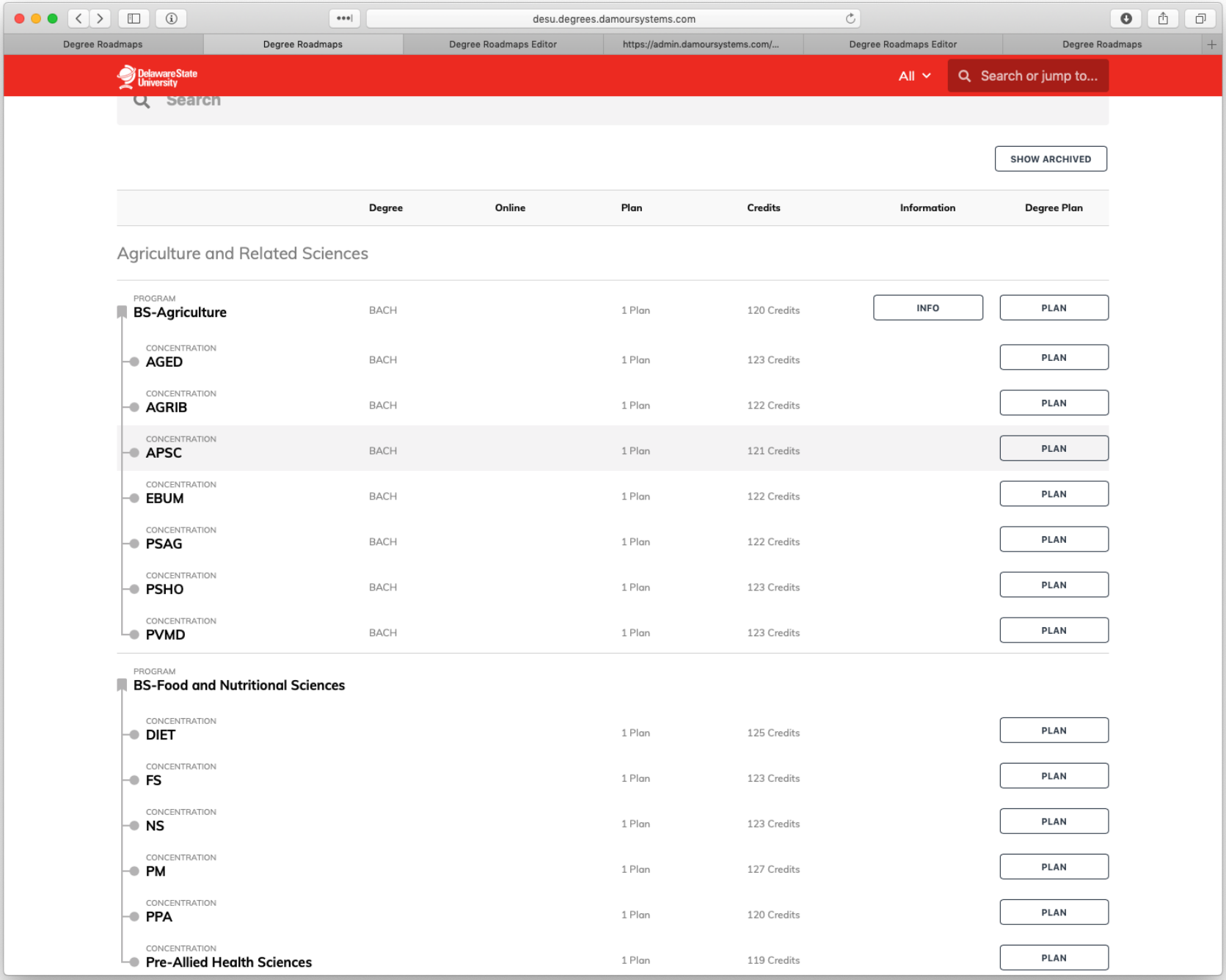
Career	Median Salary
Mechanical Engineers	$83,060
Mechanical Engineering Technologists	$61,580
Mechanical Drafters	$52,200
Mechanical Engineering Technicians	$53,530

* Data obtained from the Occupational Information Network (O*NET) under sponsorship of the U.S. Department of Labor/Employment and Training Administration (USDOL/ETA).

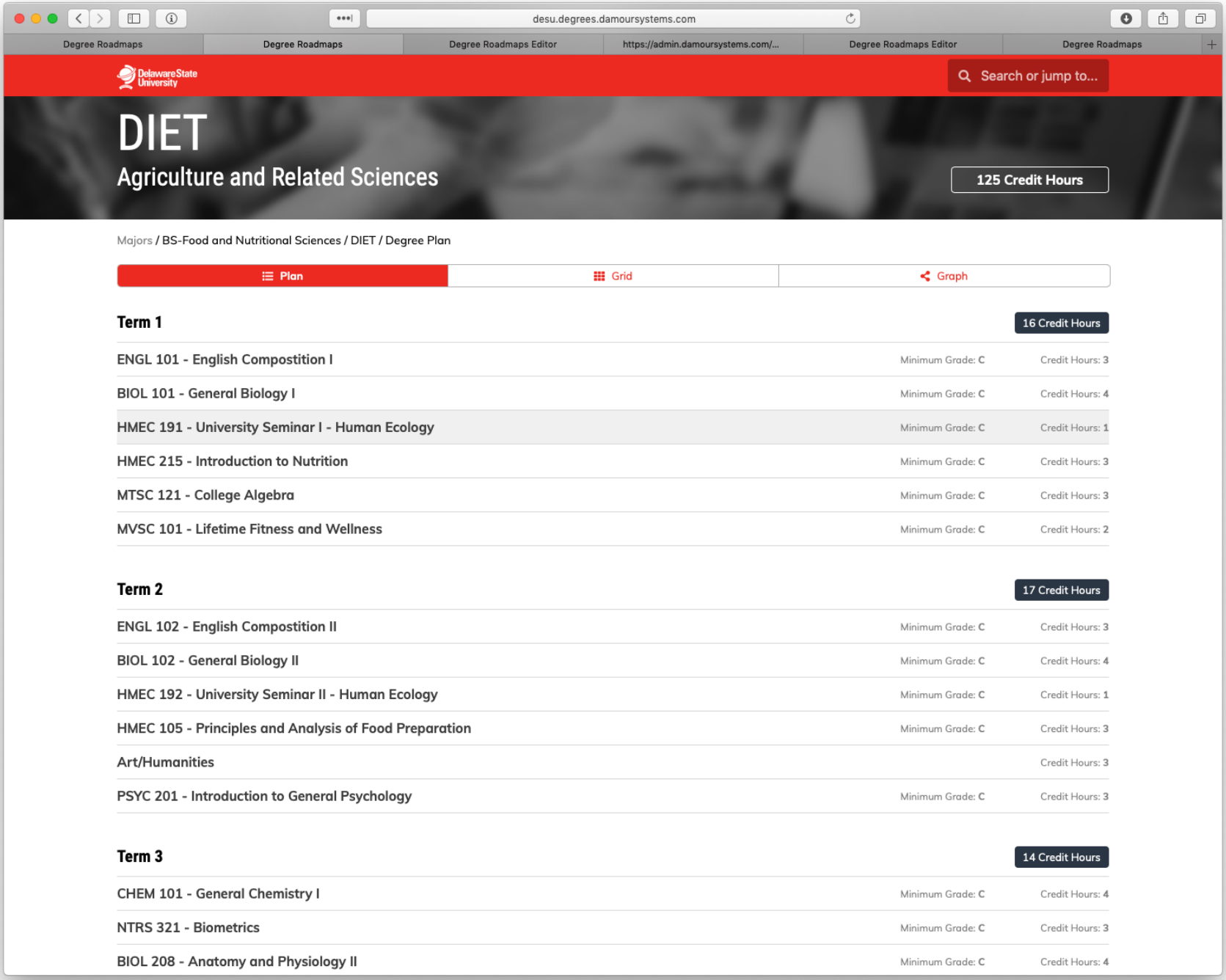
Contact Information:

Anna Mae Apodaca: **Coordinator, Program Advisement**
(505) 277-2762
aapodaca@unm.edu

Degree Plans – Explore Plans



Degree Plans – Pathways



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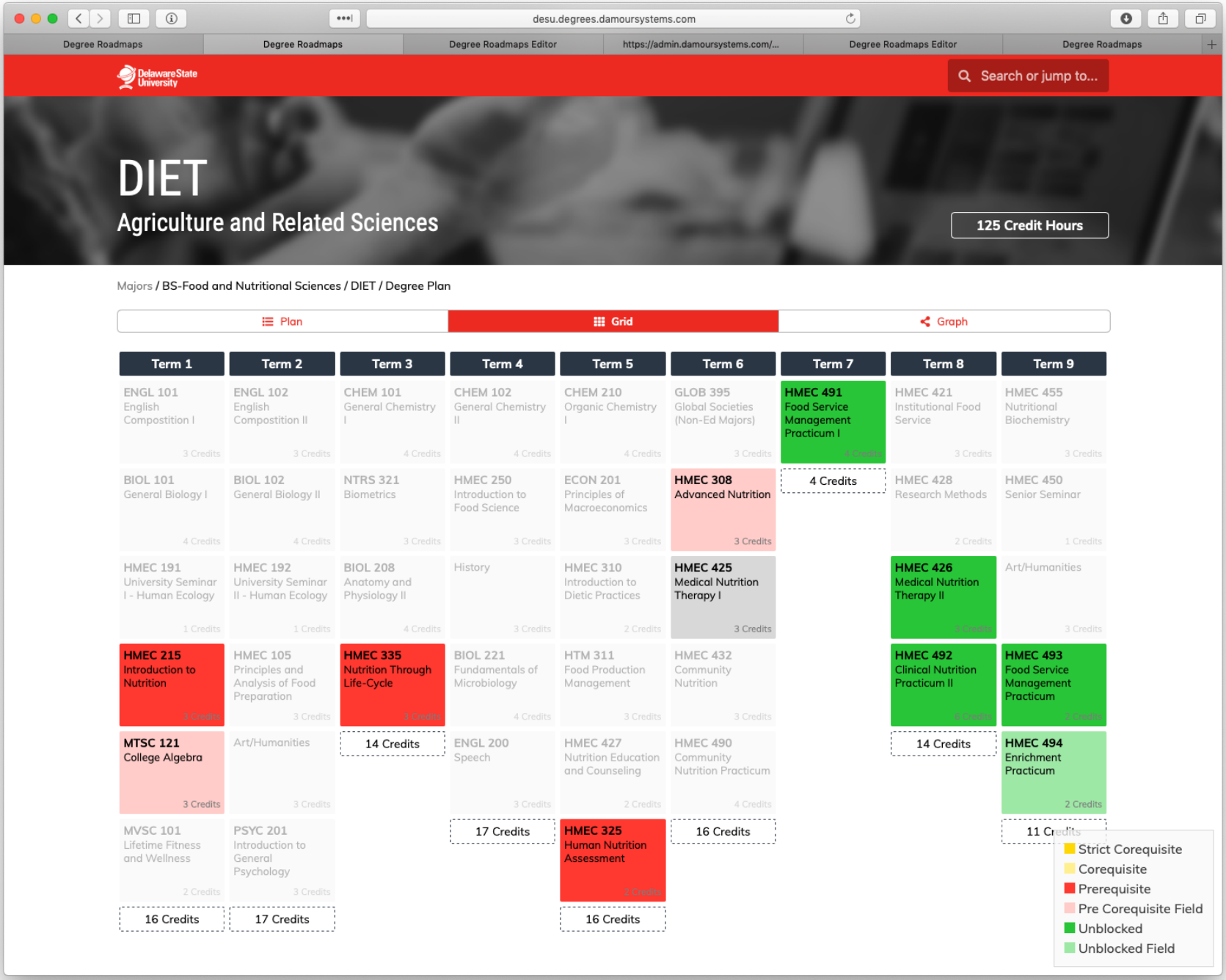

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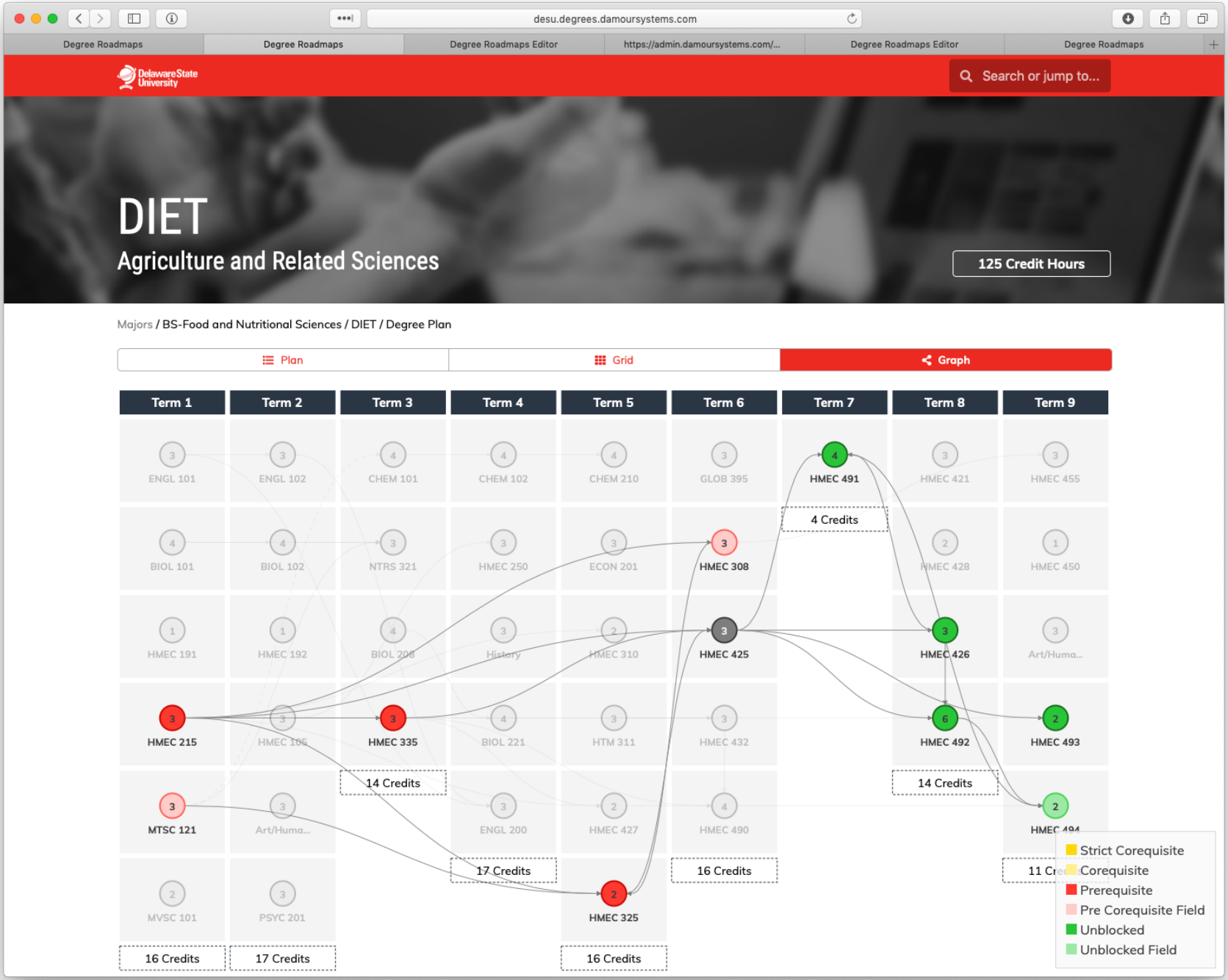

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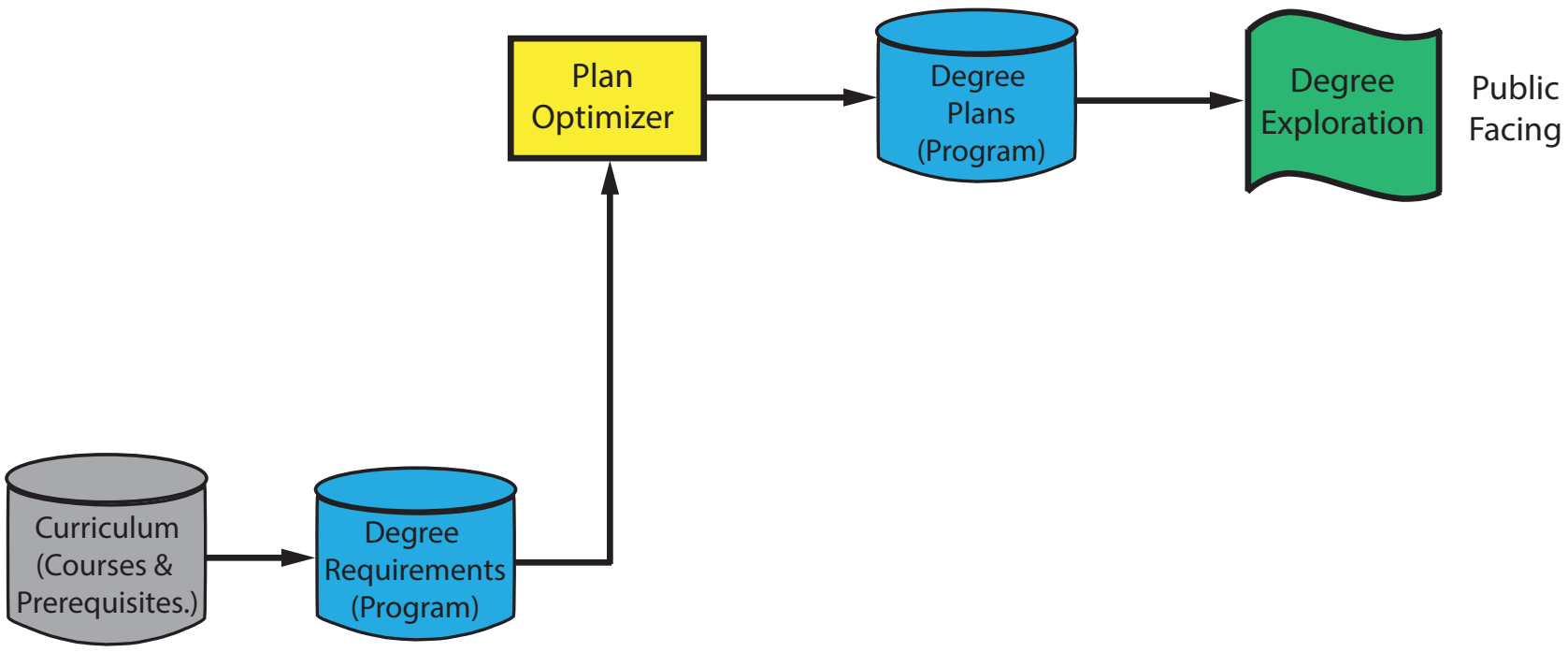

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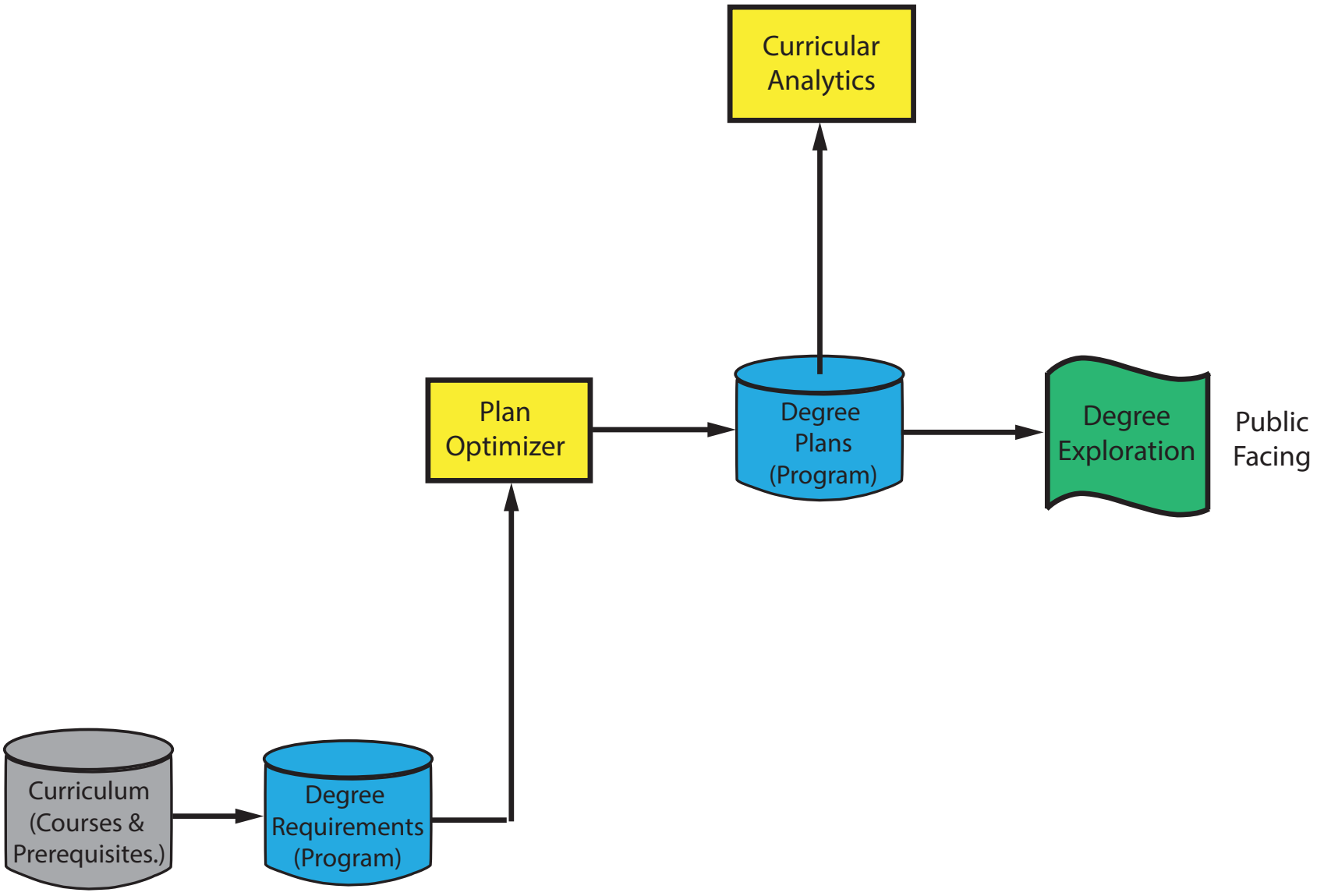

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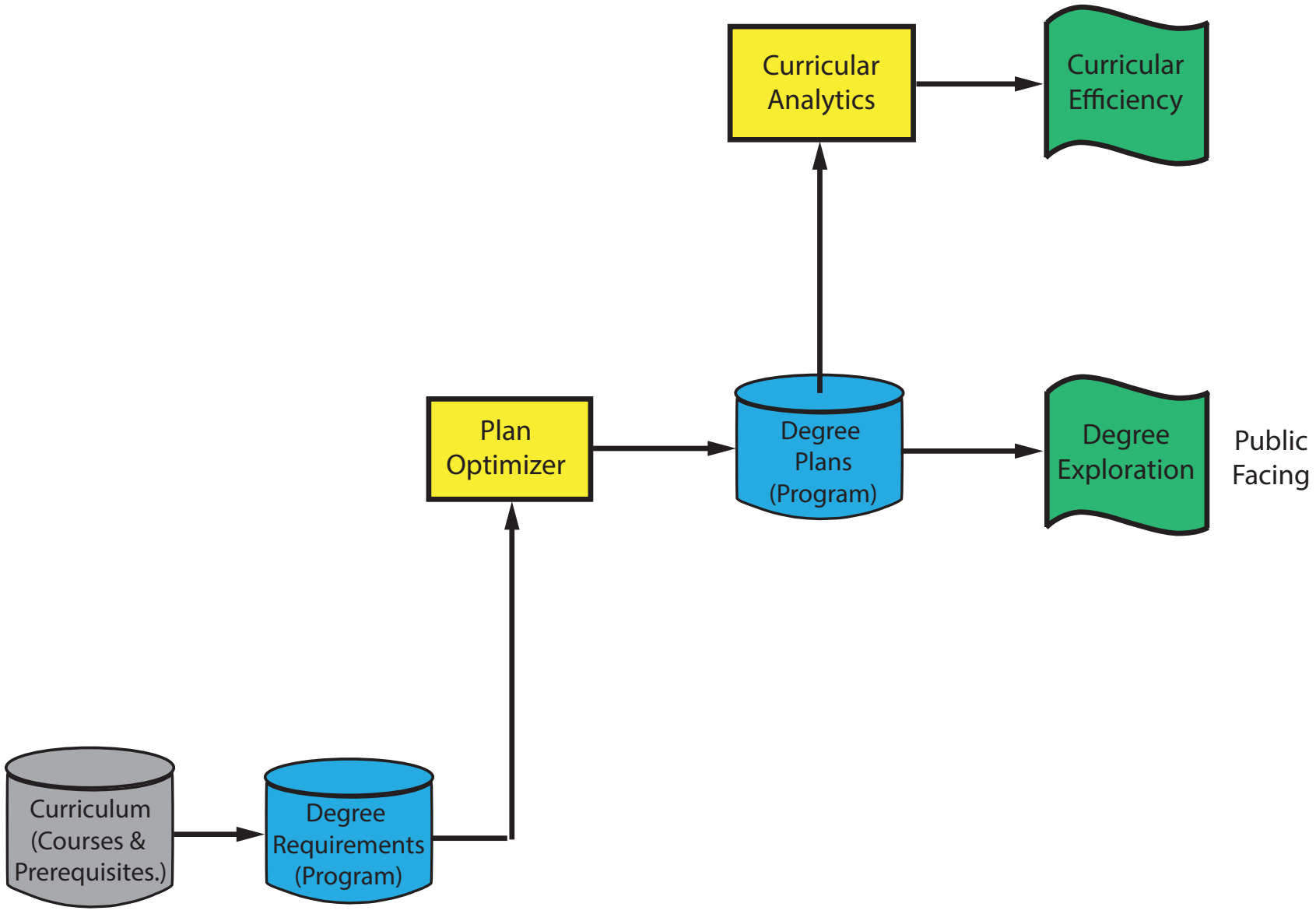

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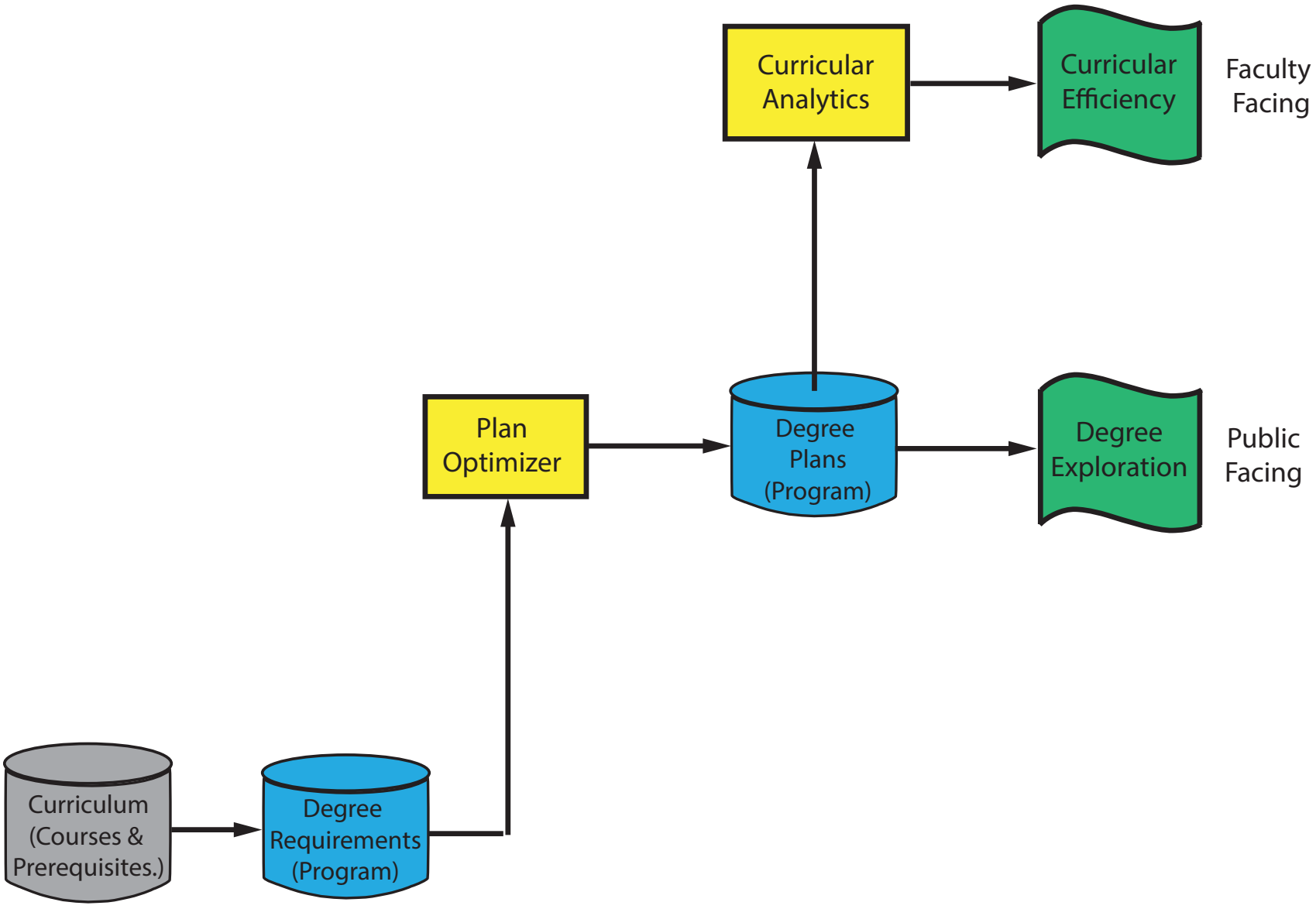

Curricular Analytics

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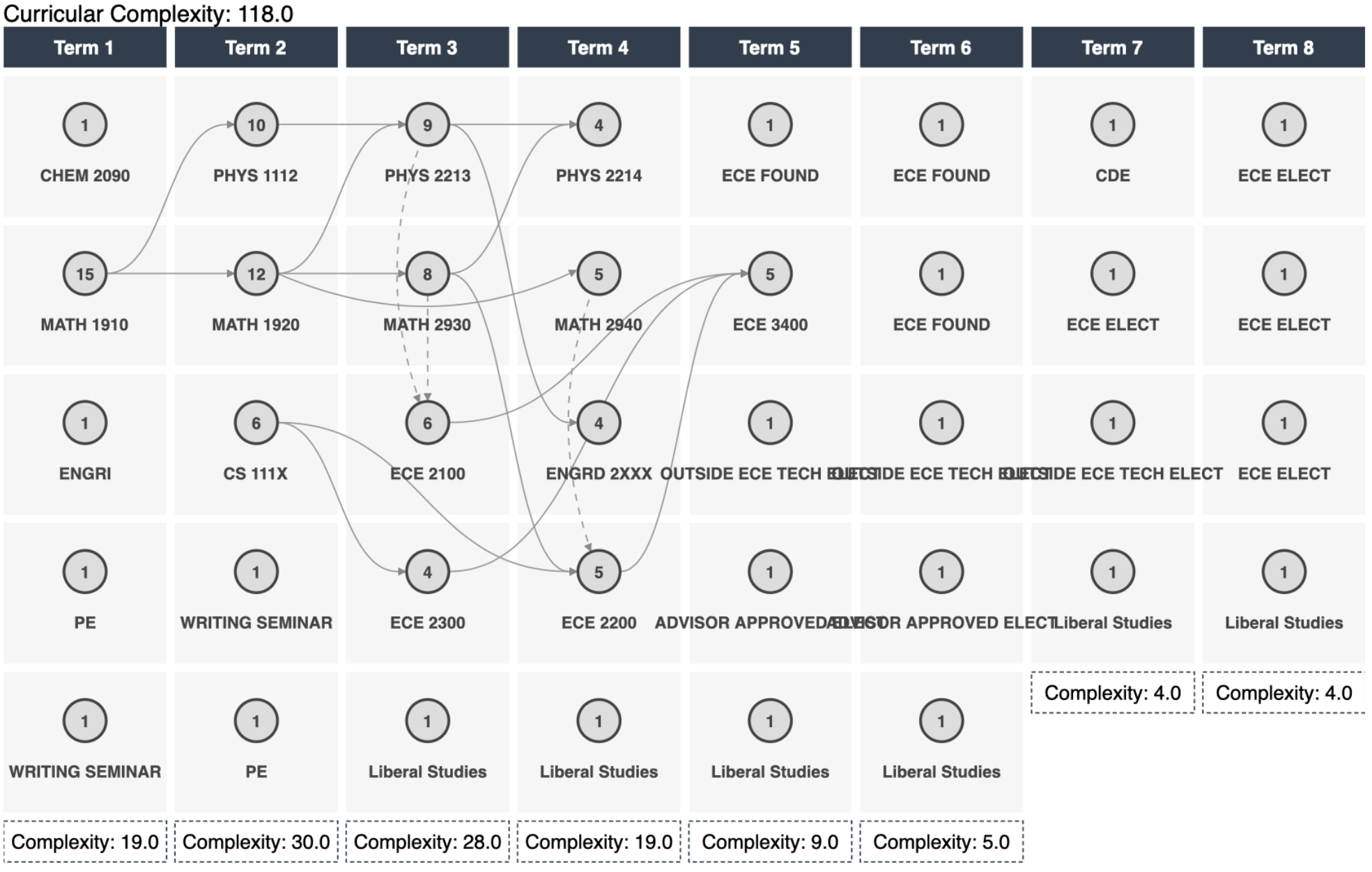
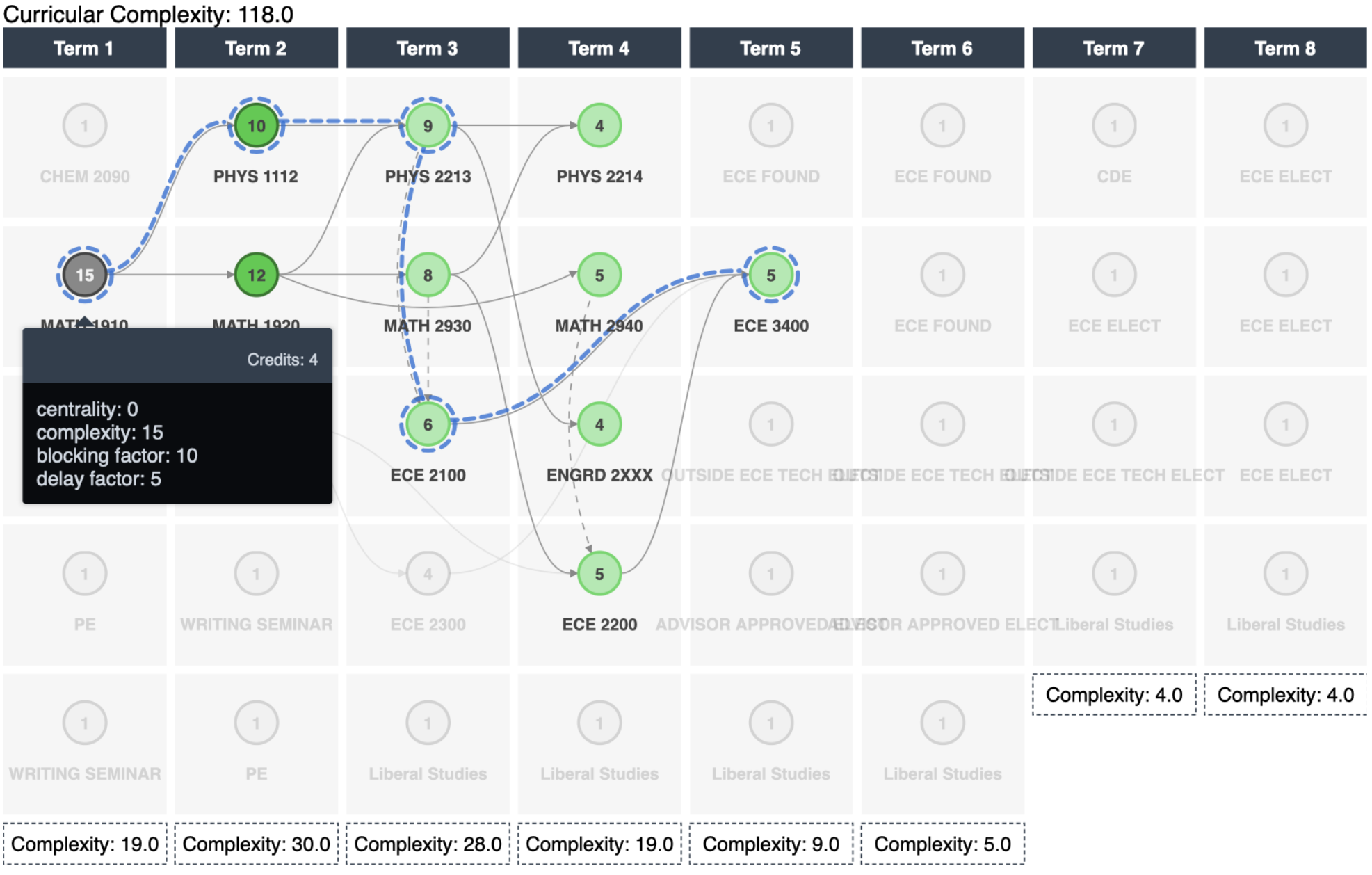
- **Is it possible to improve outcomes without changing how you teach?**

Structural Complexity – Institution 1



Structural Complexity – Institution 1



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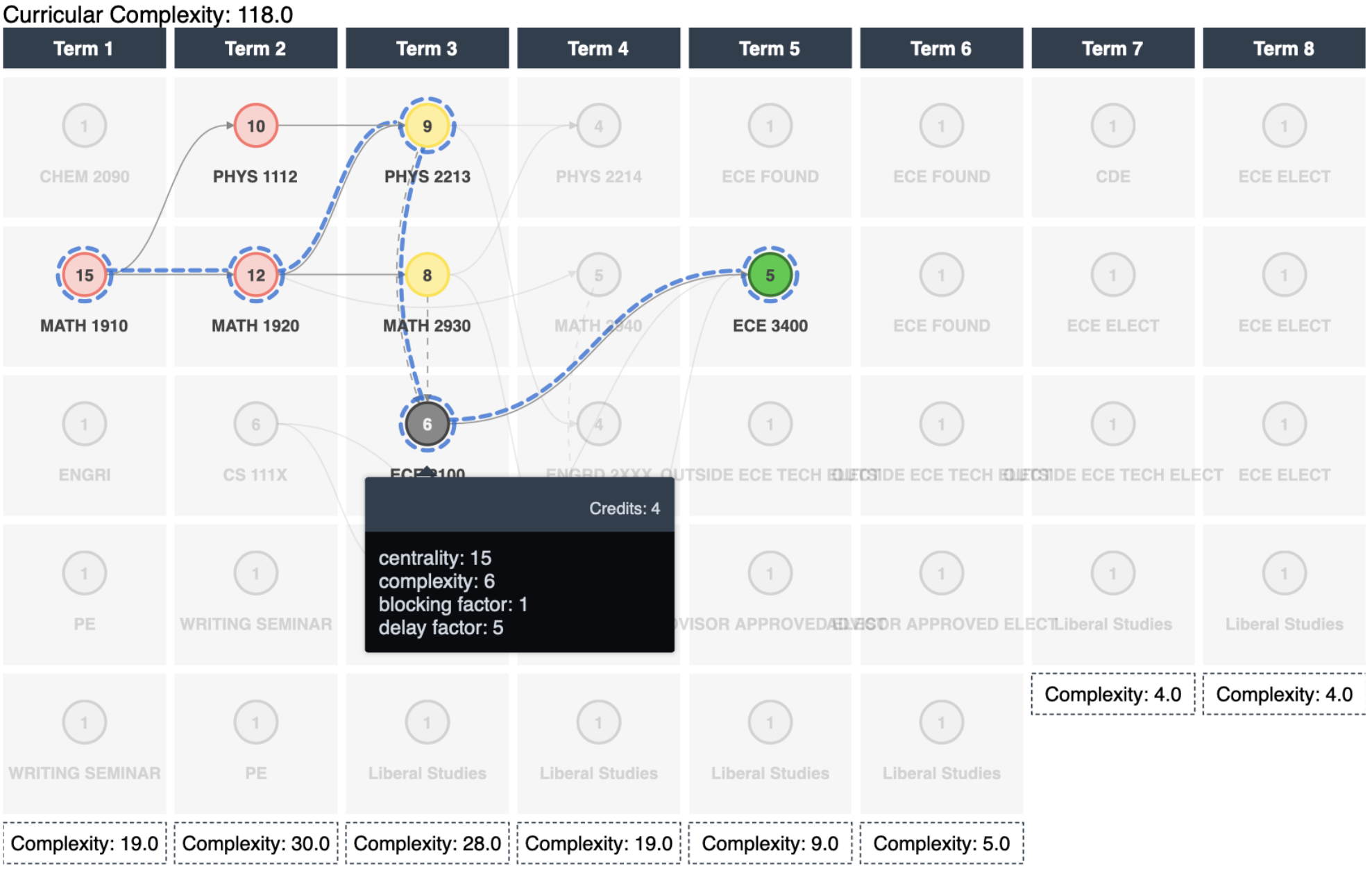
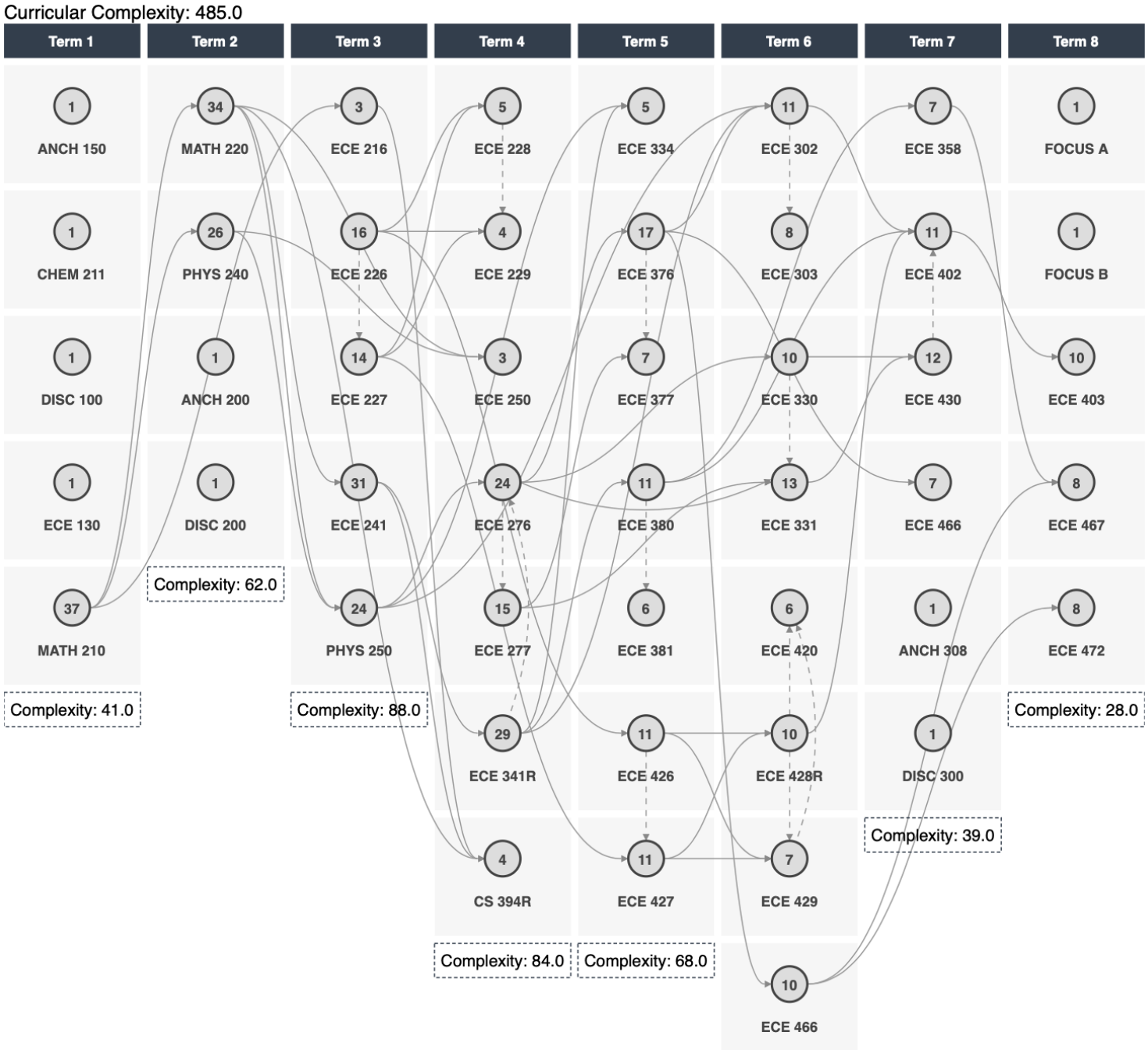


Structural Complexity – Institution 2



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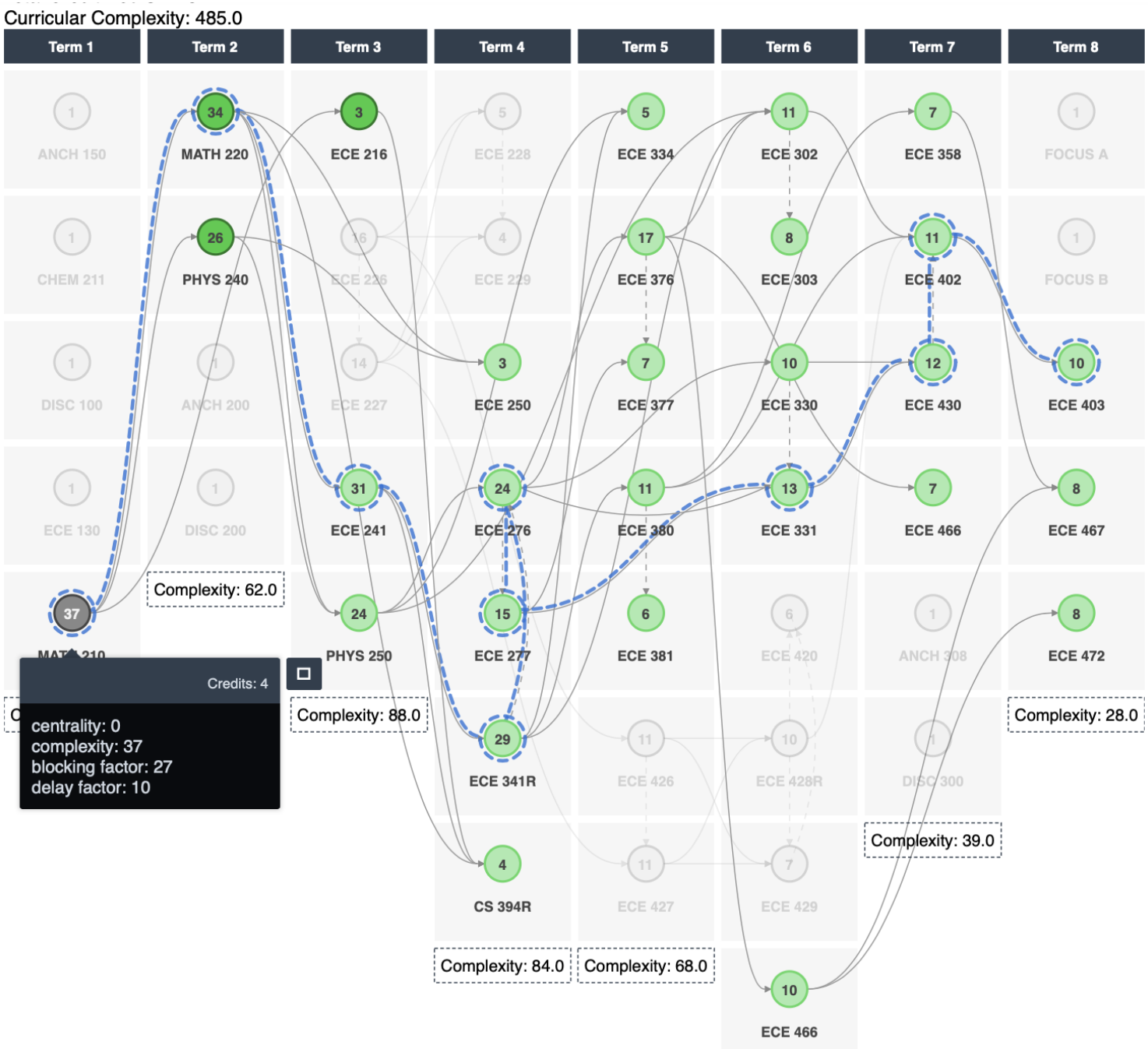

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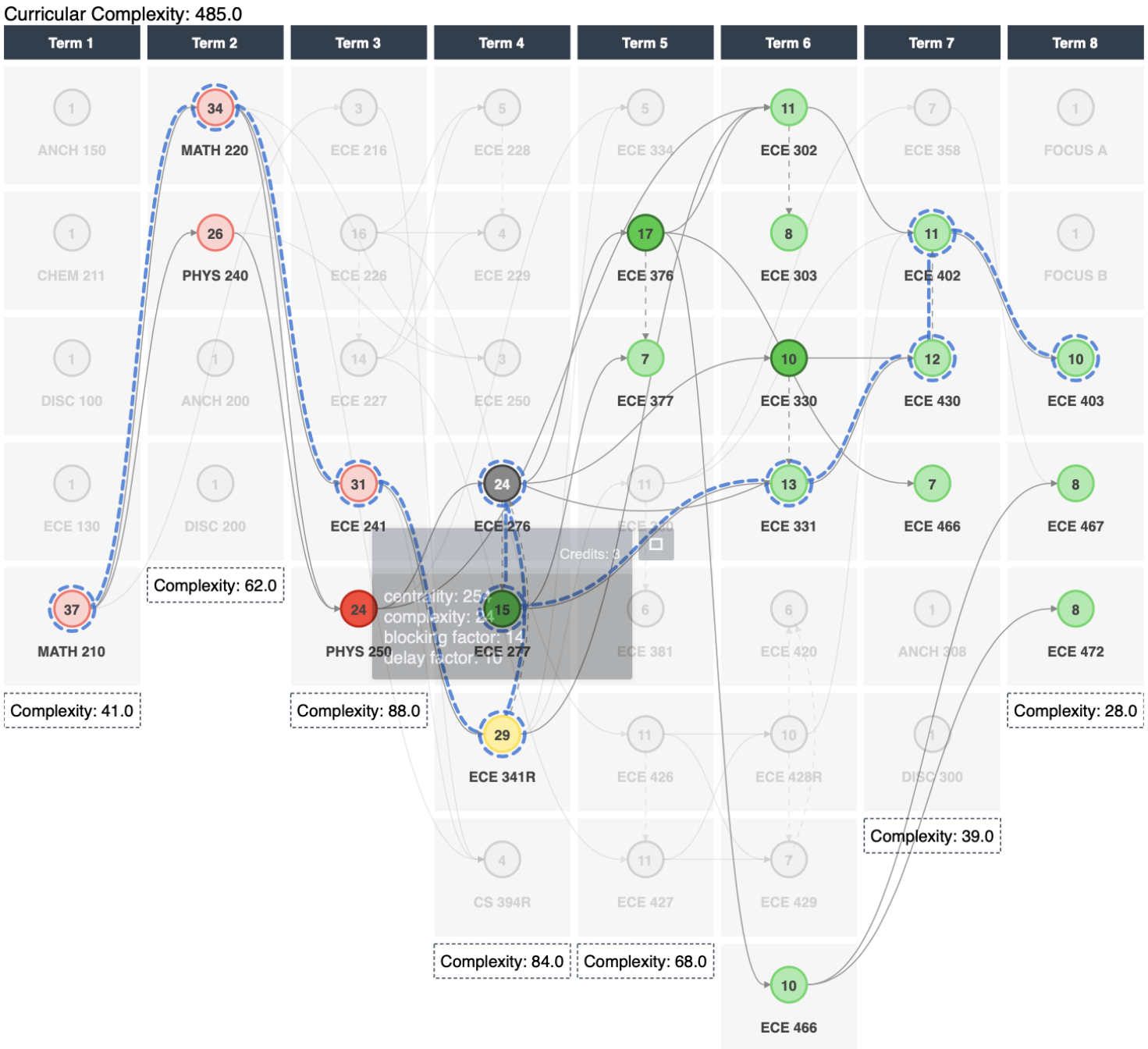
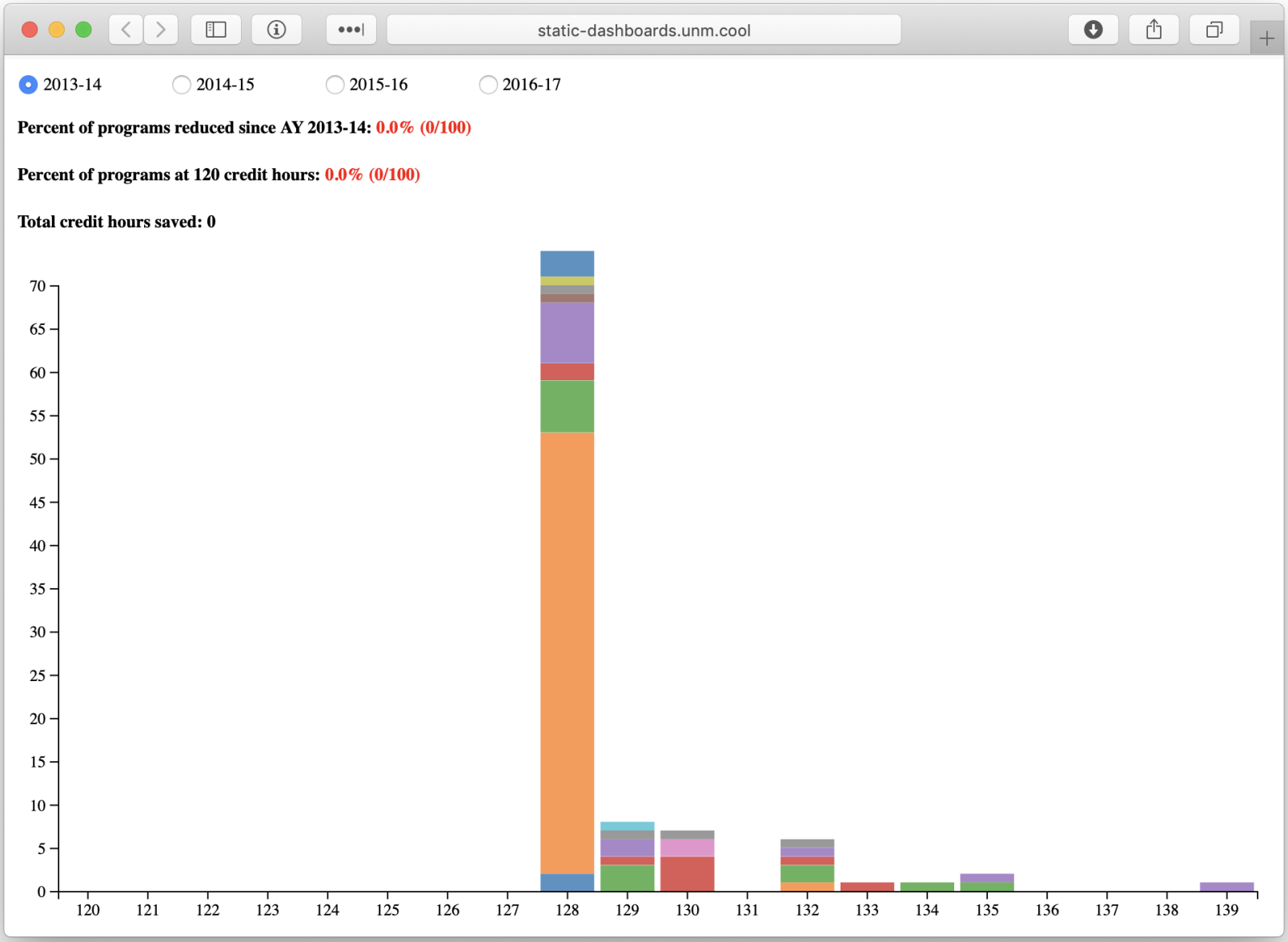


Curricular Analytics in Action

University of New Mexico —



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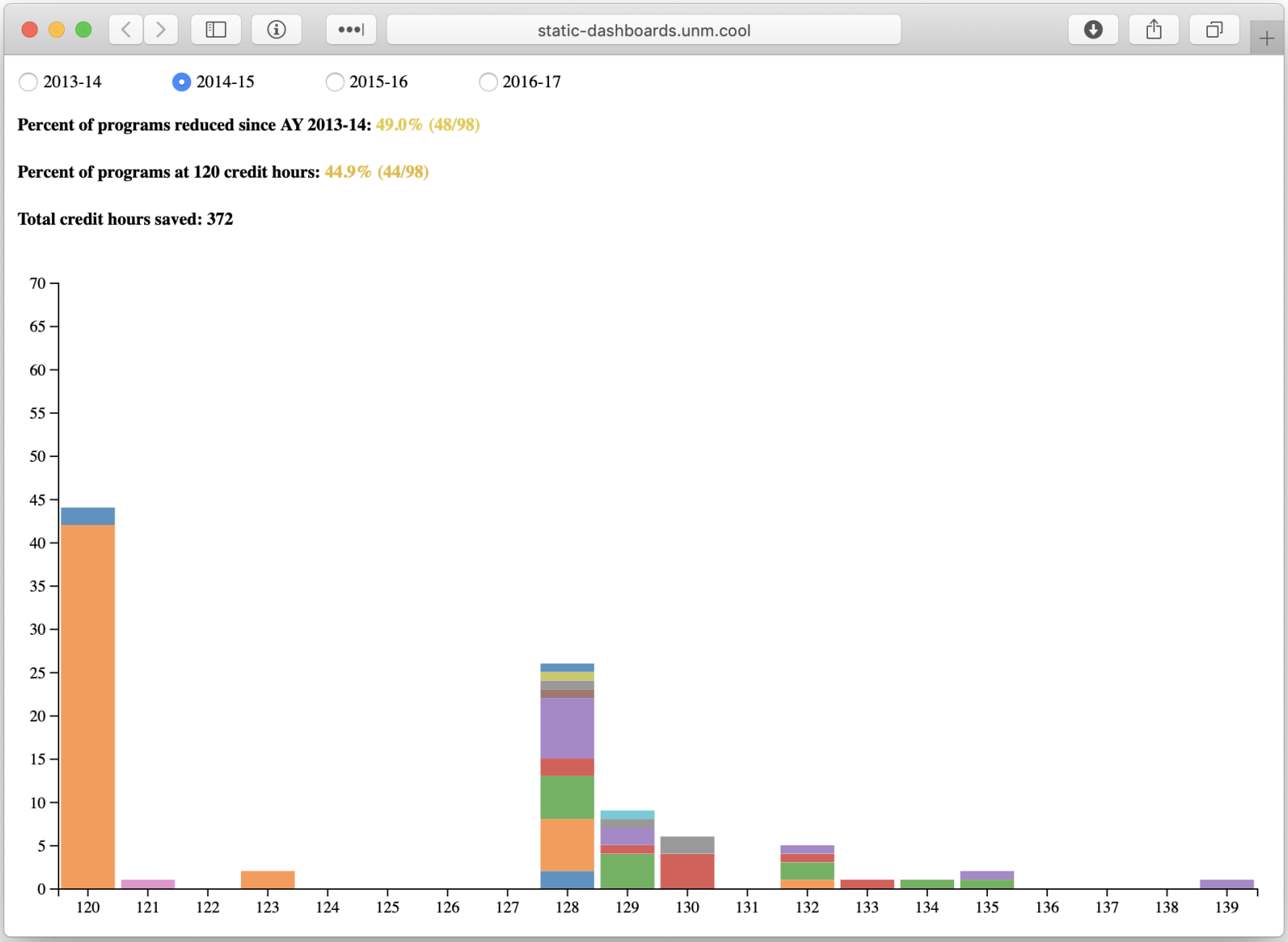

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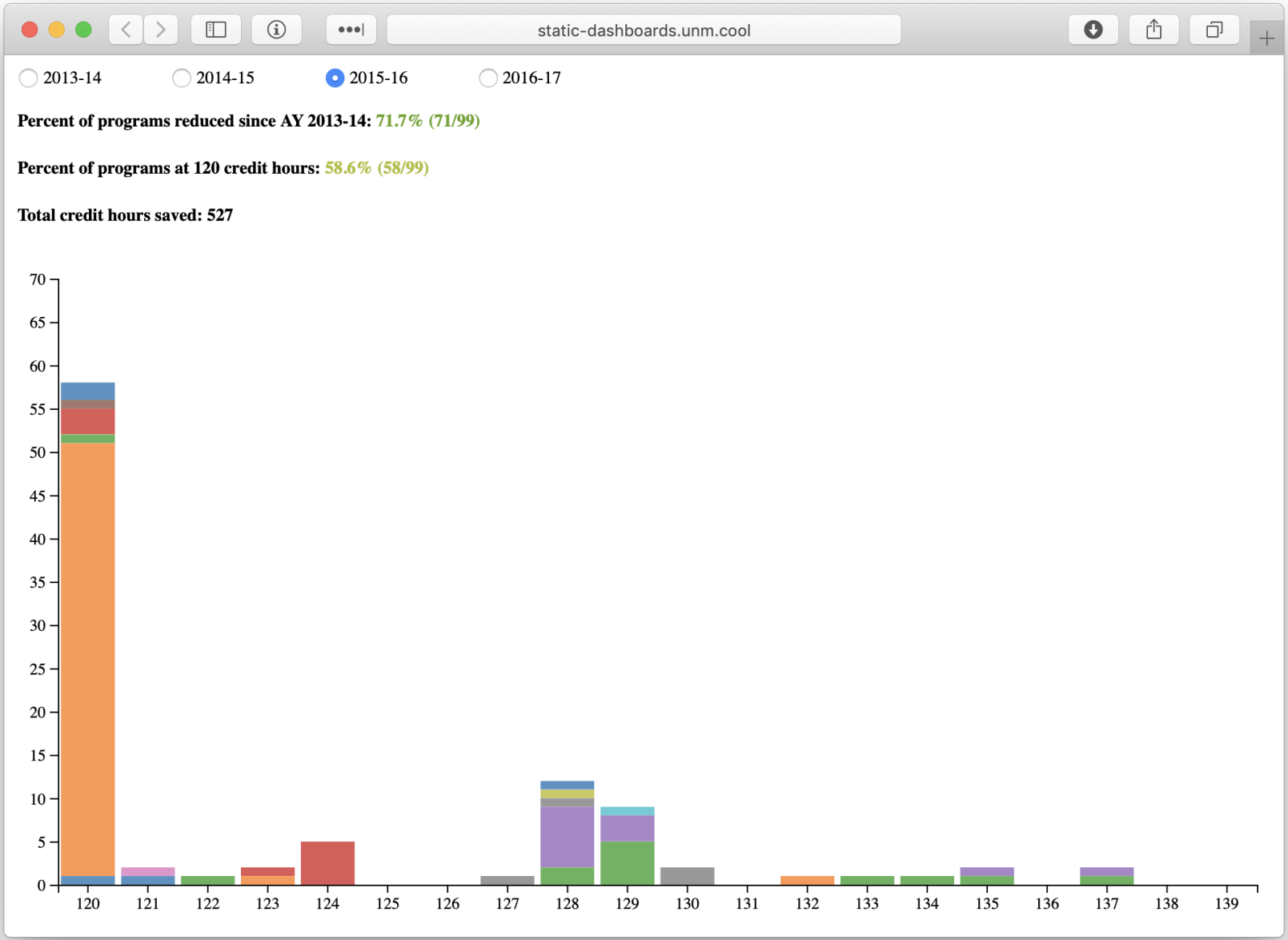

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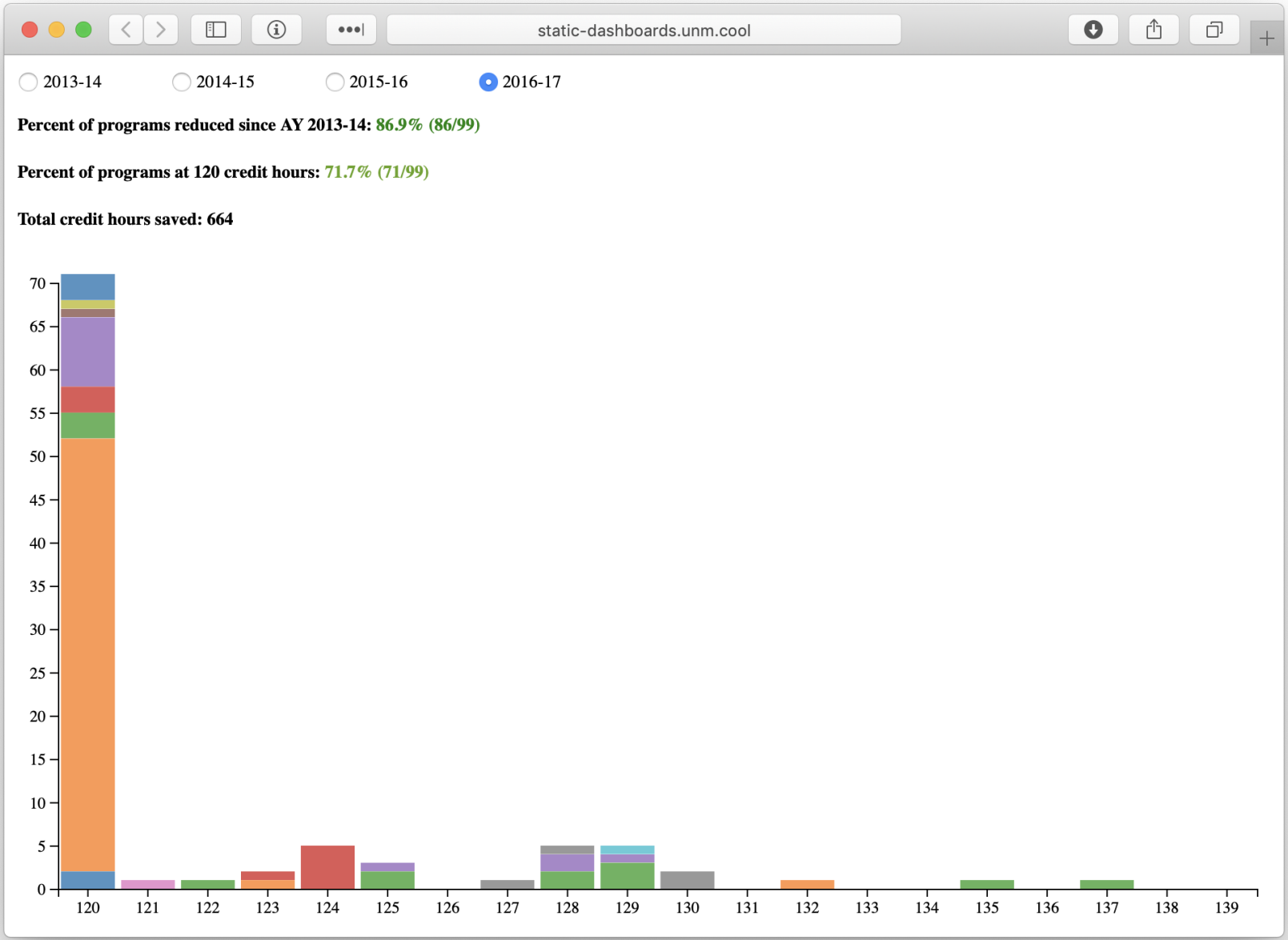

Curricular Analytics in Action

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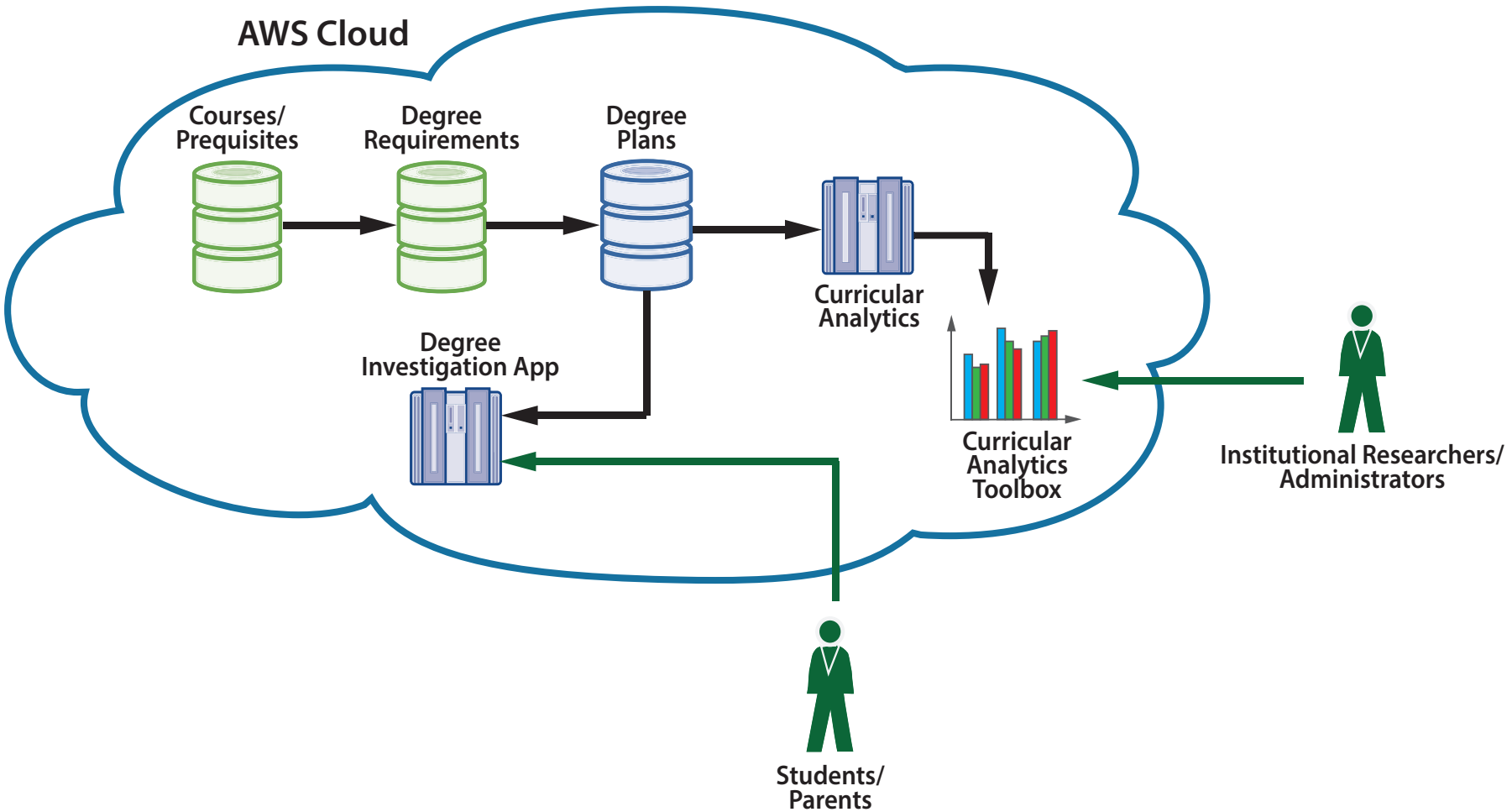
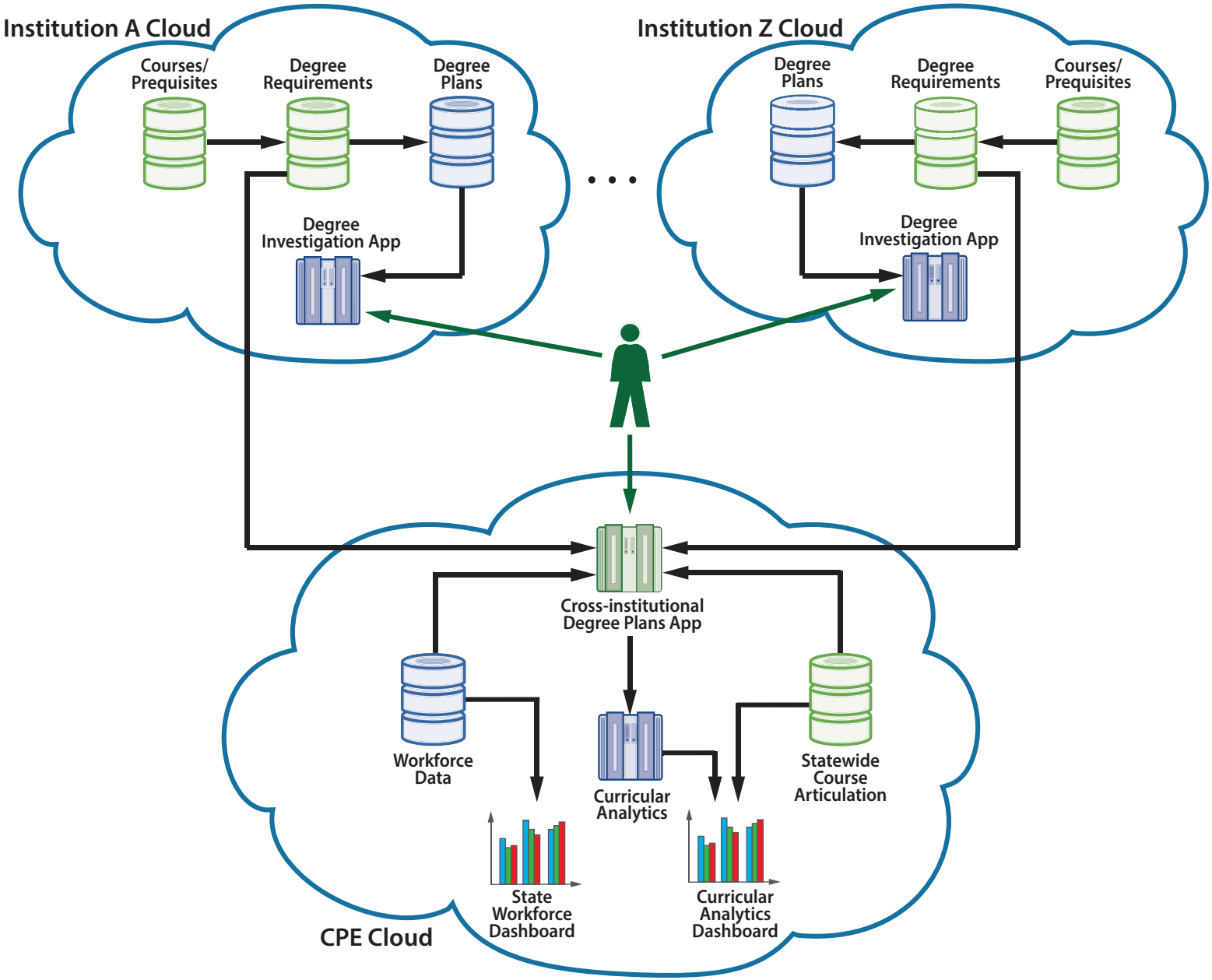
- Very little change in the six-year graduation rate ... the pathways were made more efficient.

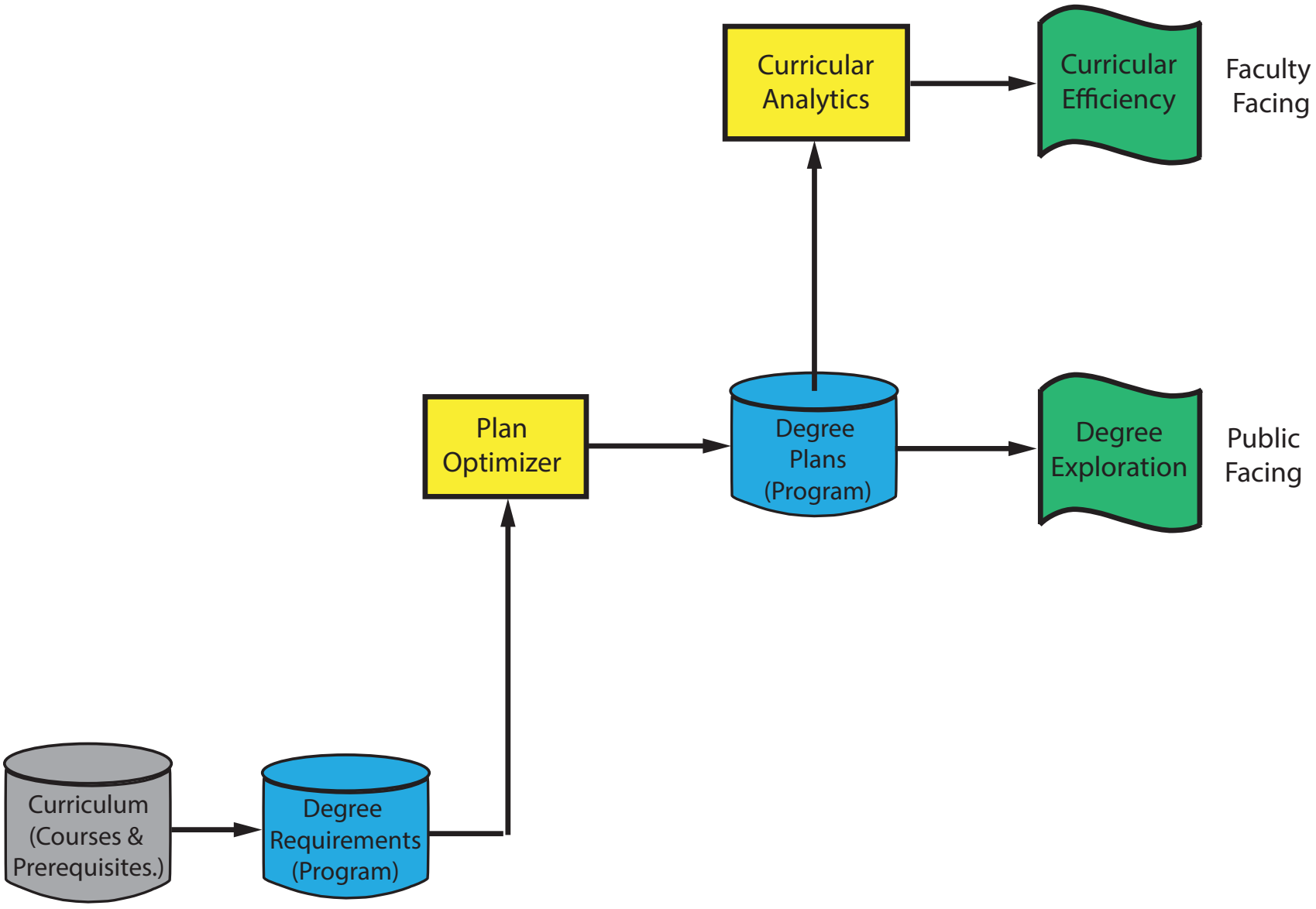
Institutional Infrastructure



Statewide Infrastructure



Analytics Journey



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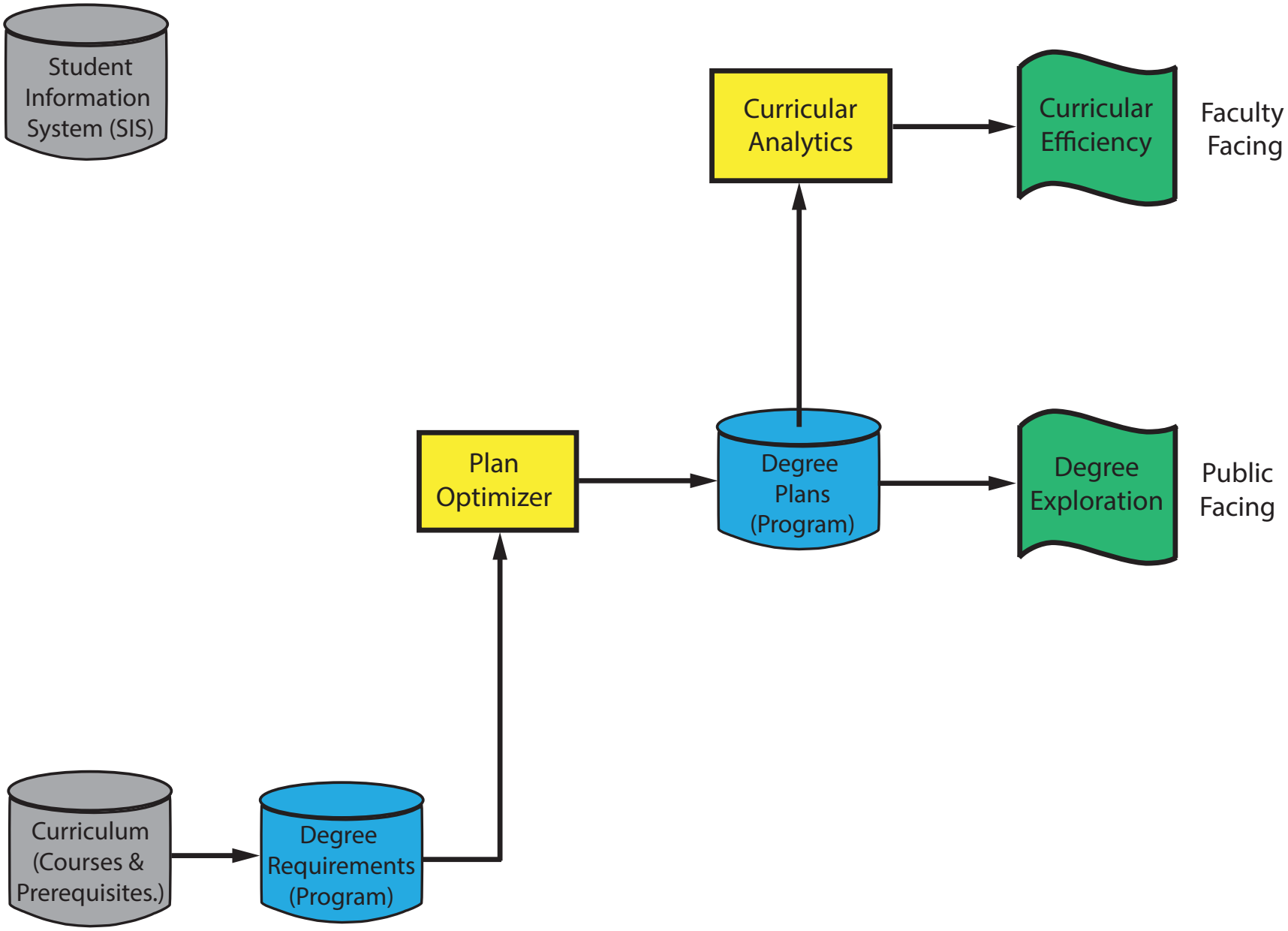

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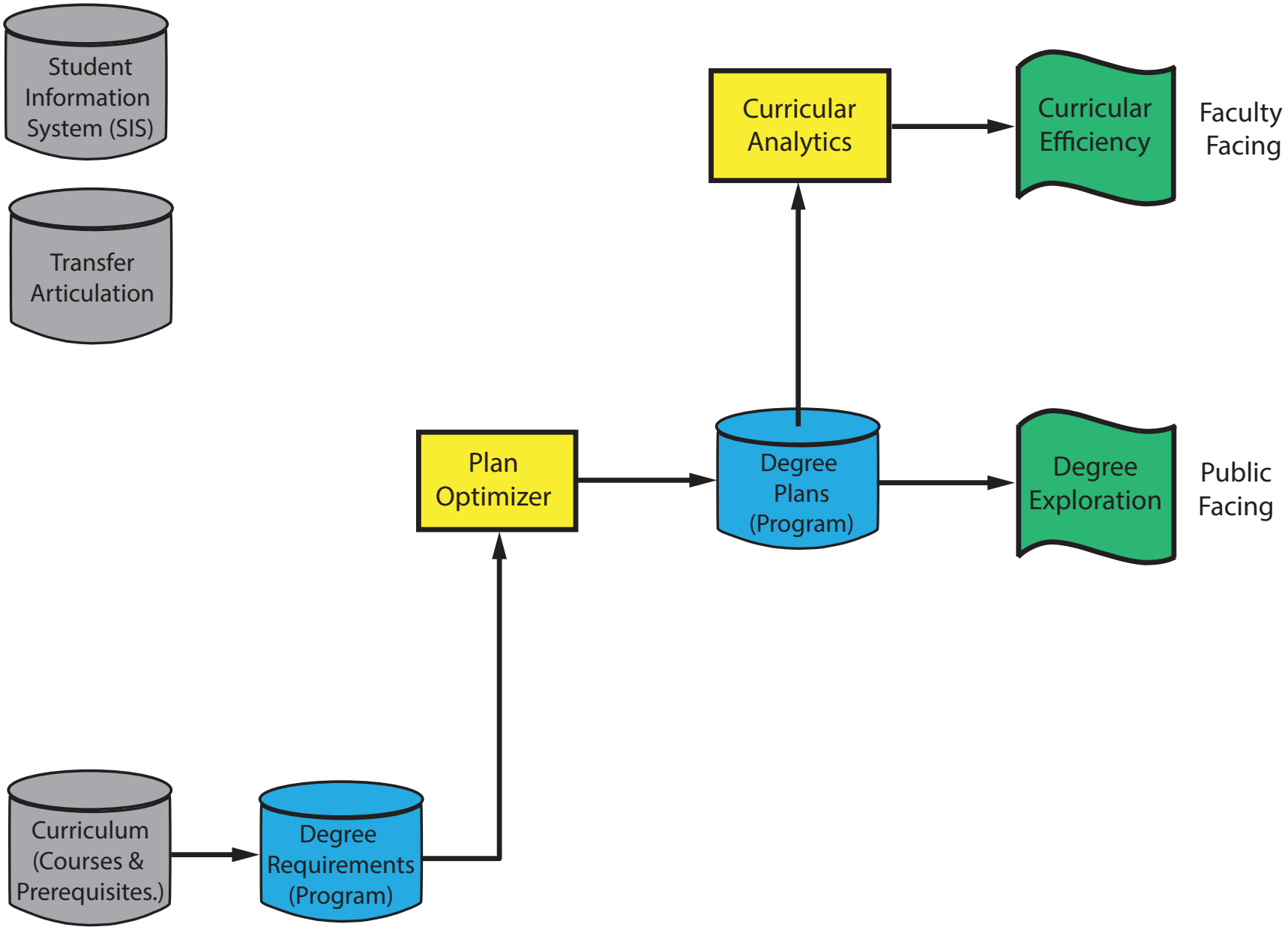

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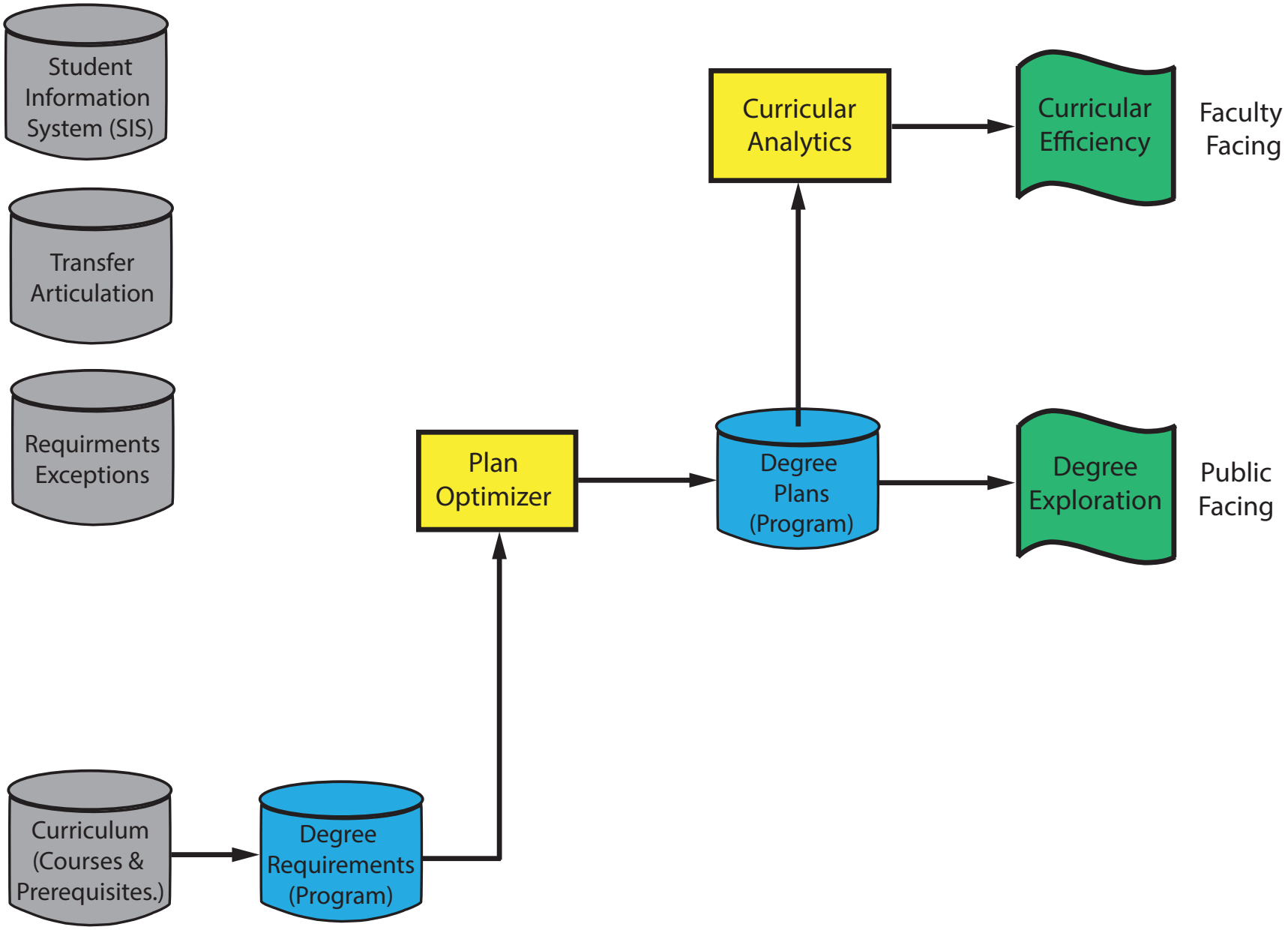

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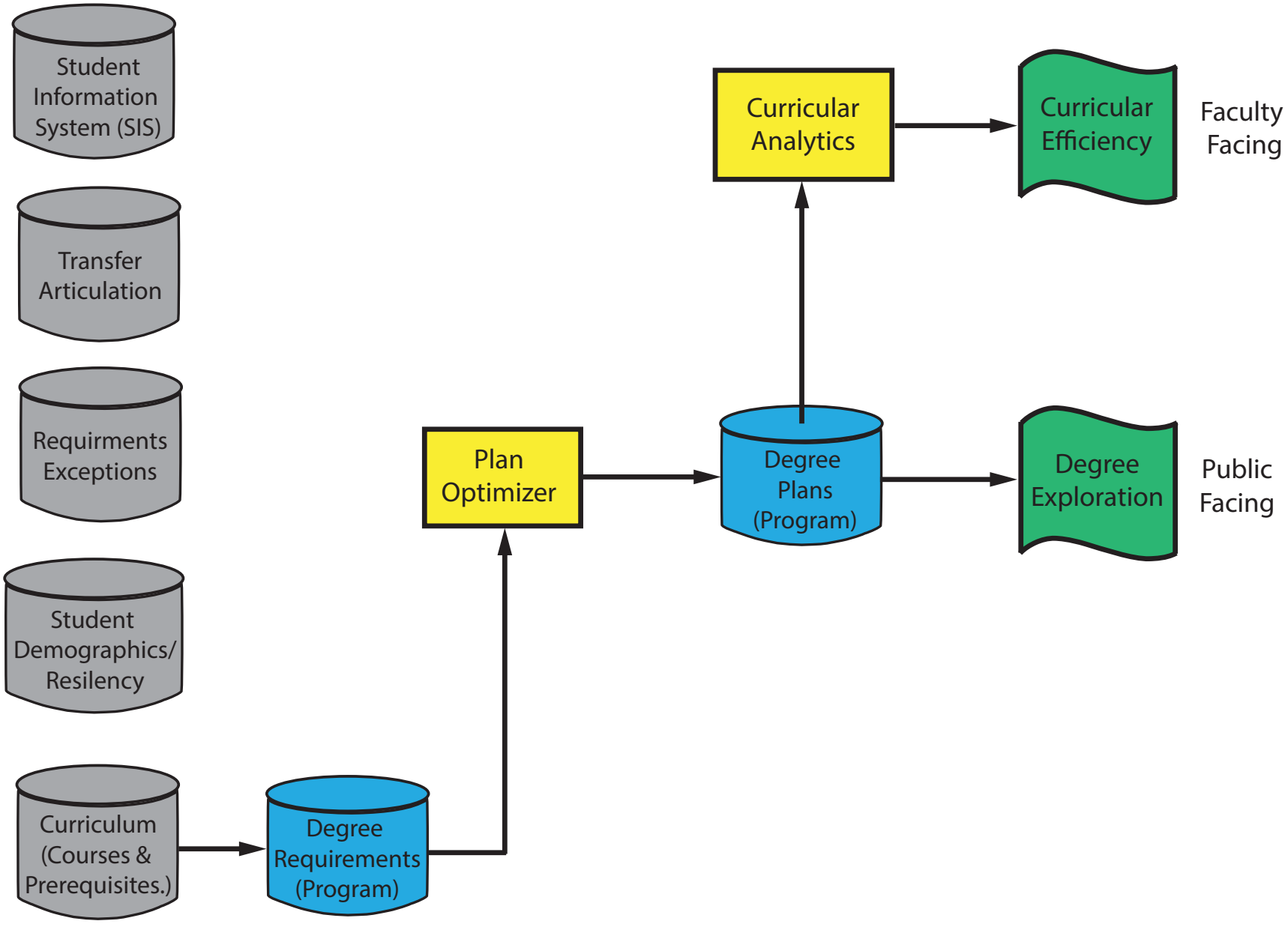

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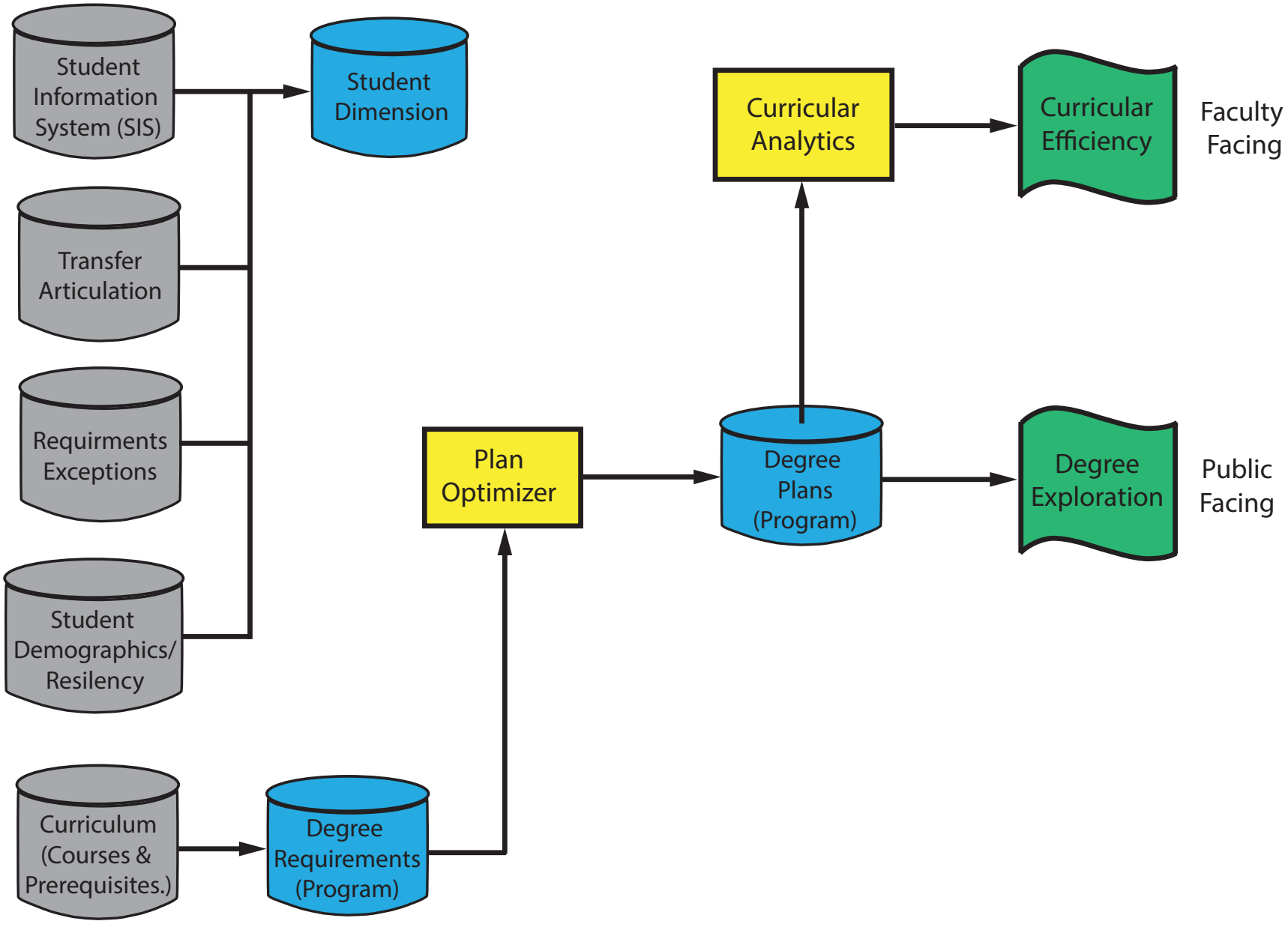

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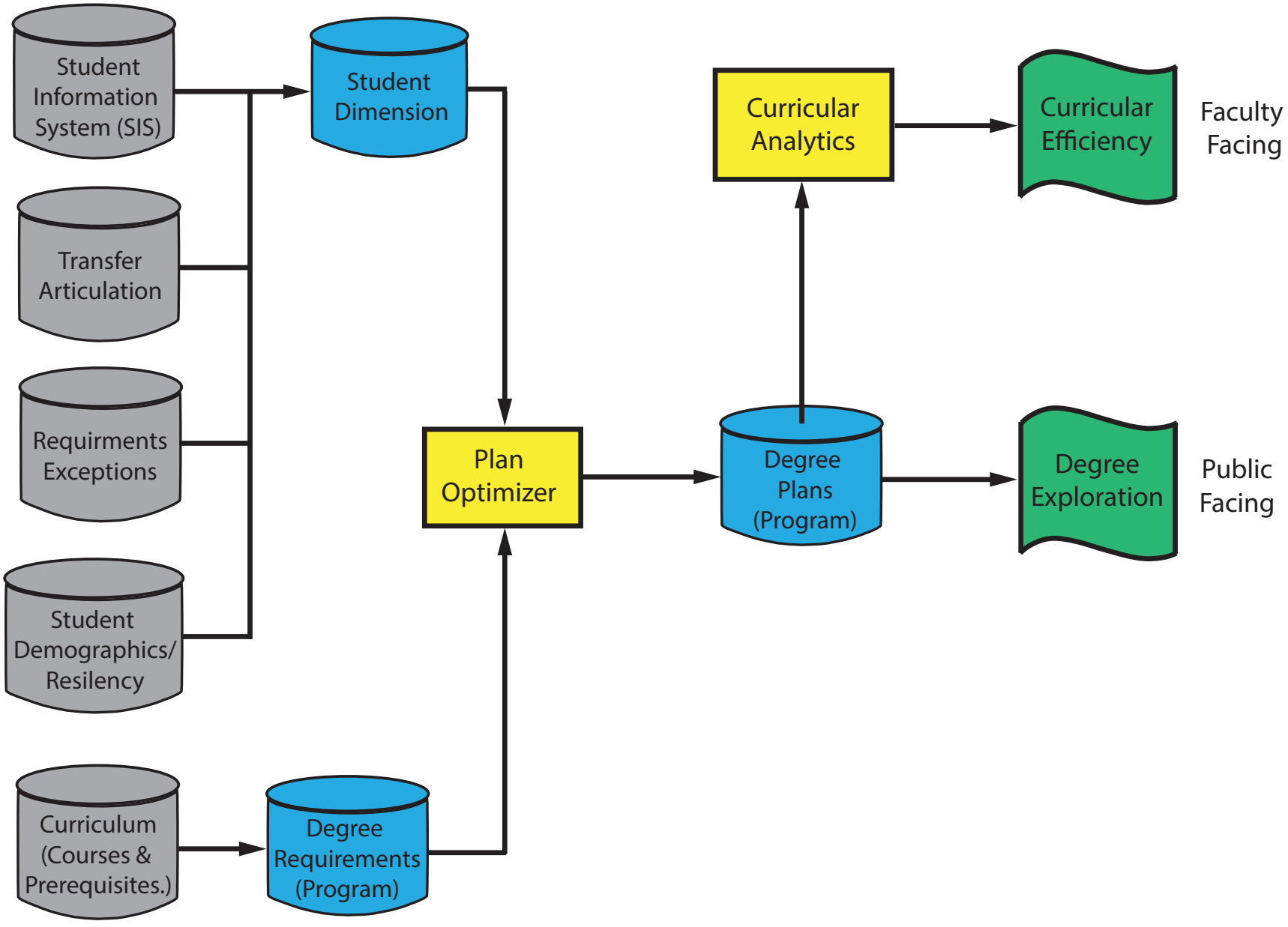

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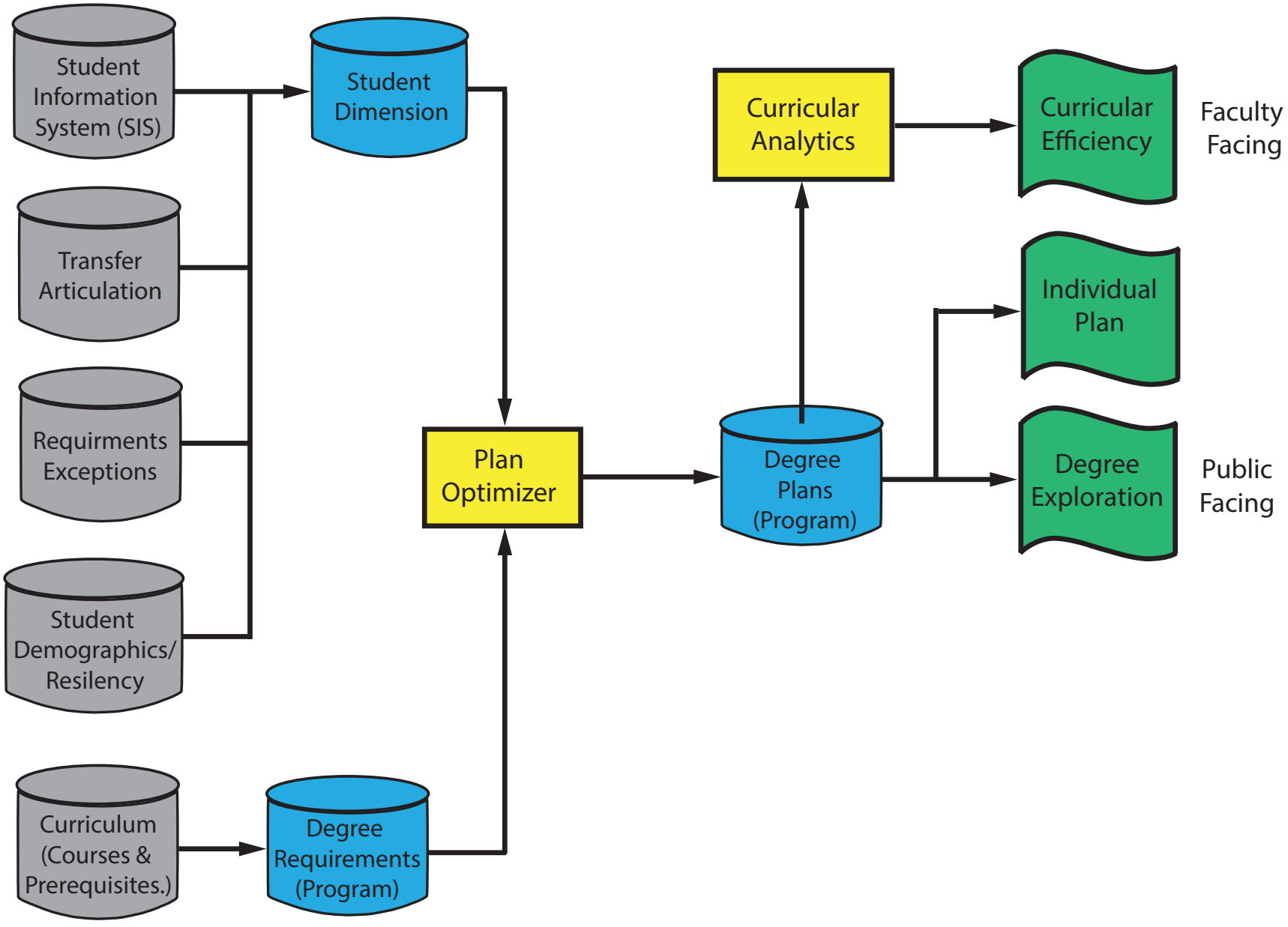

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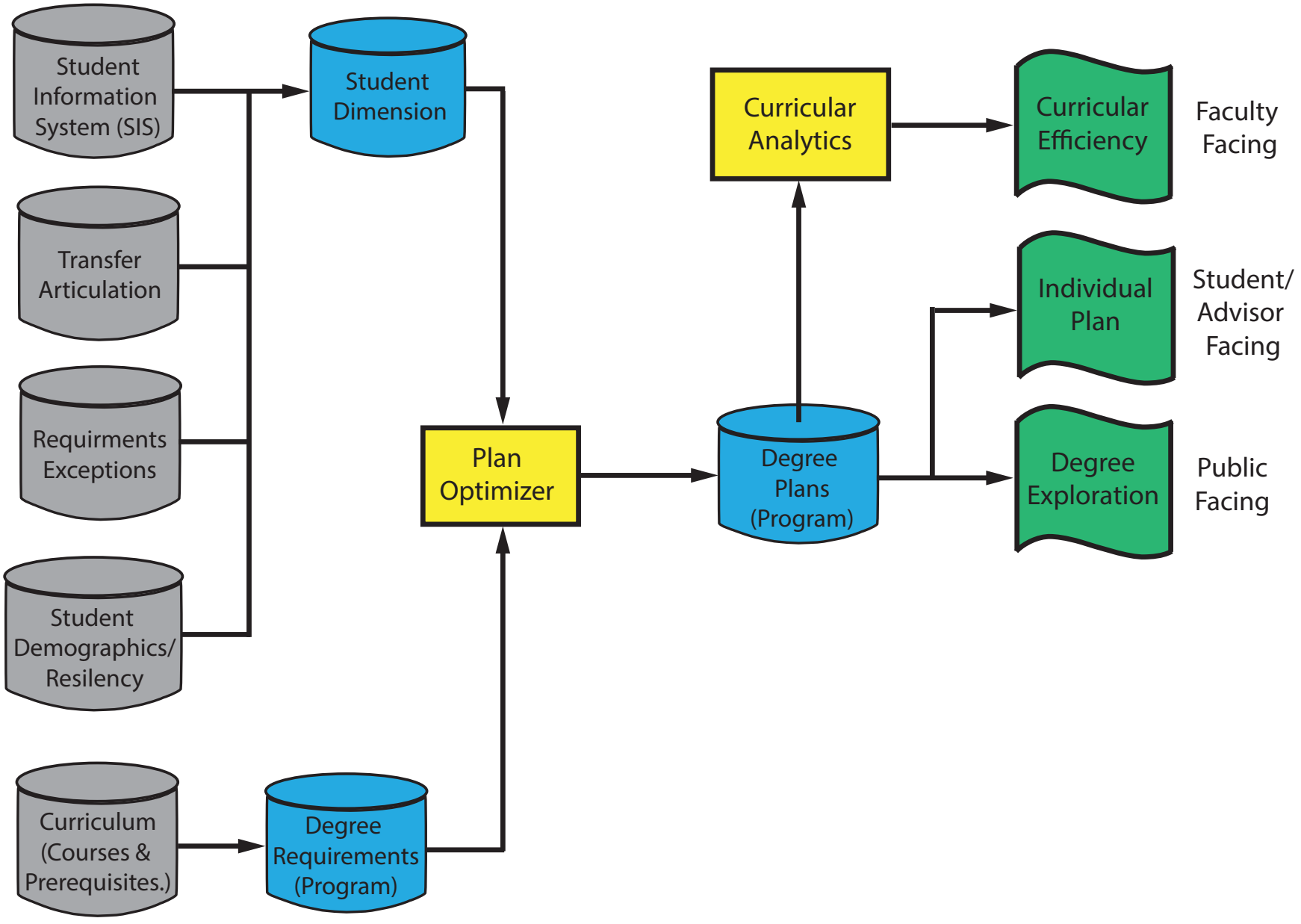

Degree Plan Analytics

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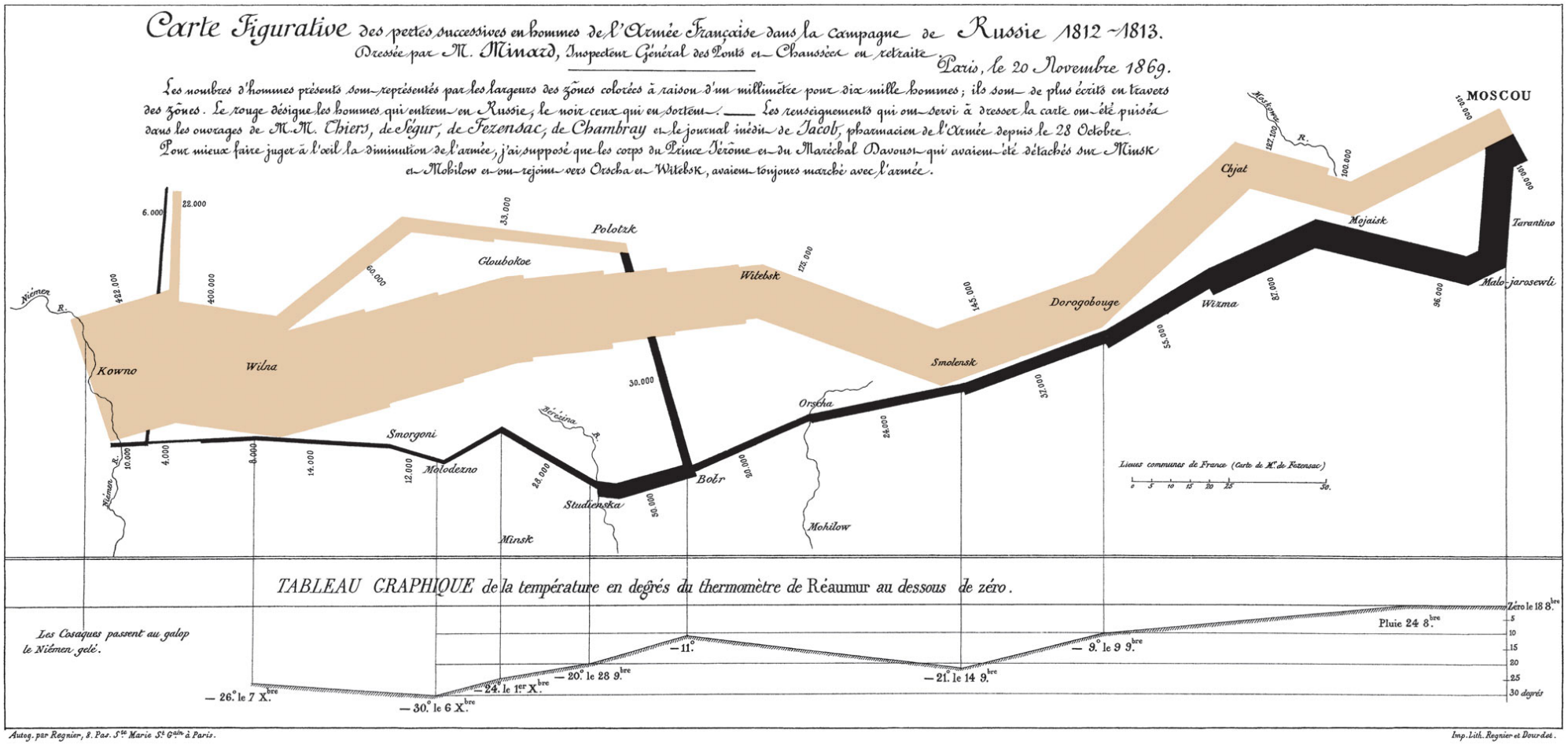
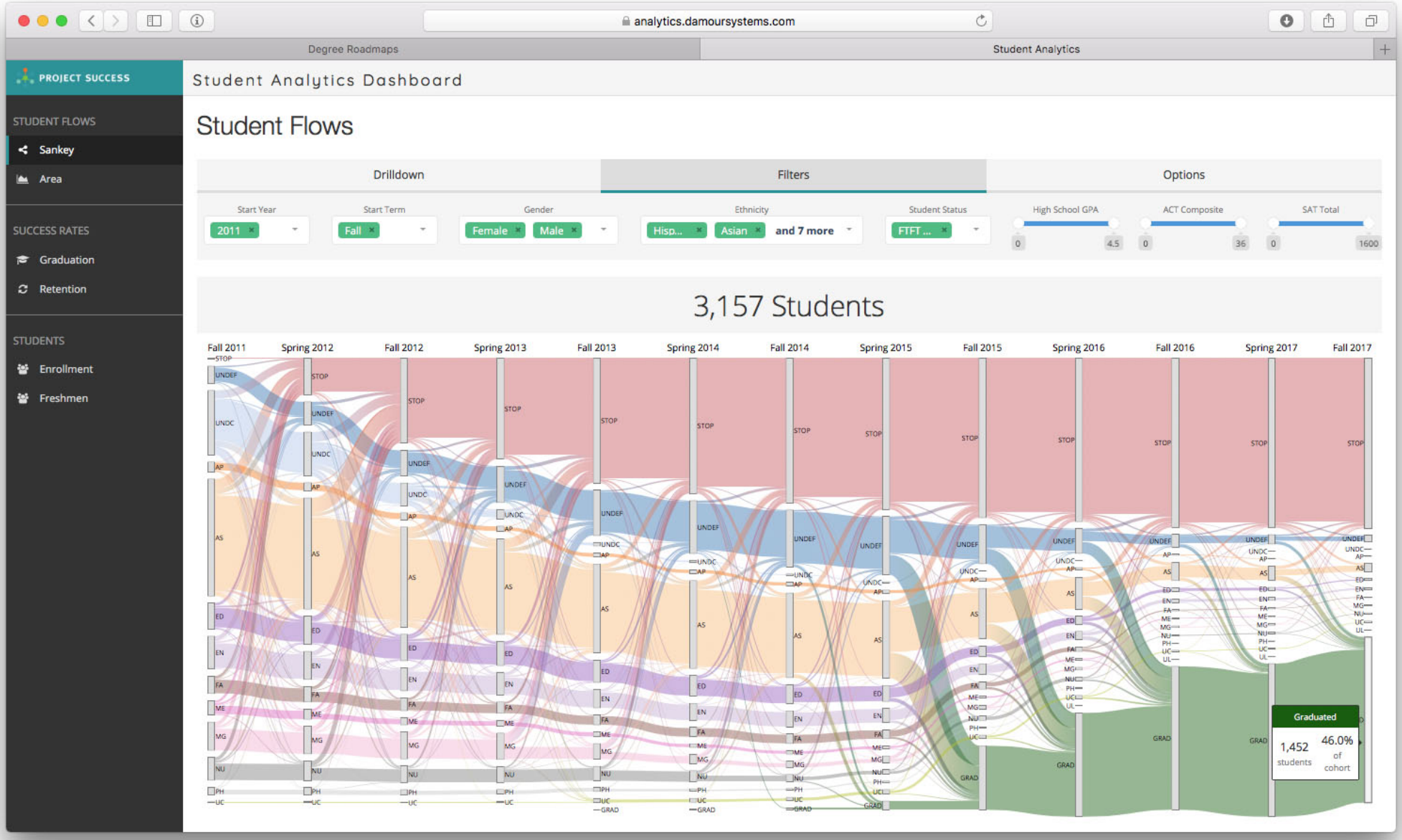
- If we can quantify these things, we can construct optimization algorithms that take a curriculum as input, and produce an optimized (personalized) degree plan as output.

Napoleon's Grande Armée – March to Moscow



Sankey Flows



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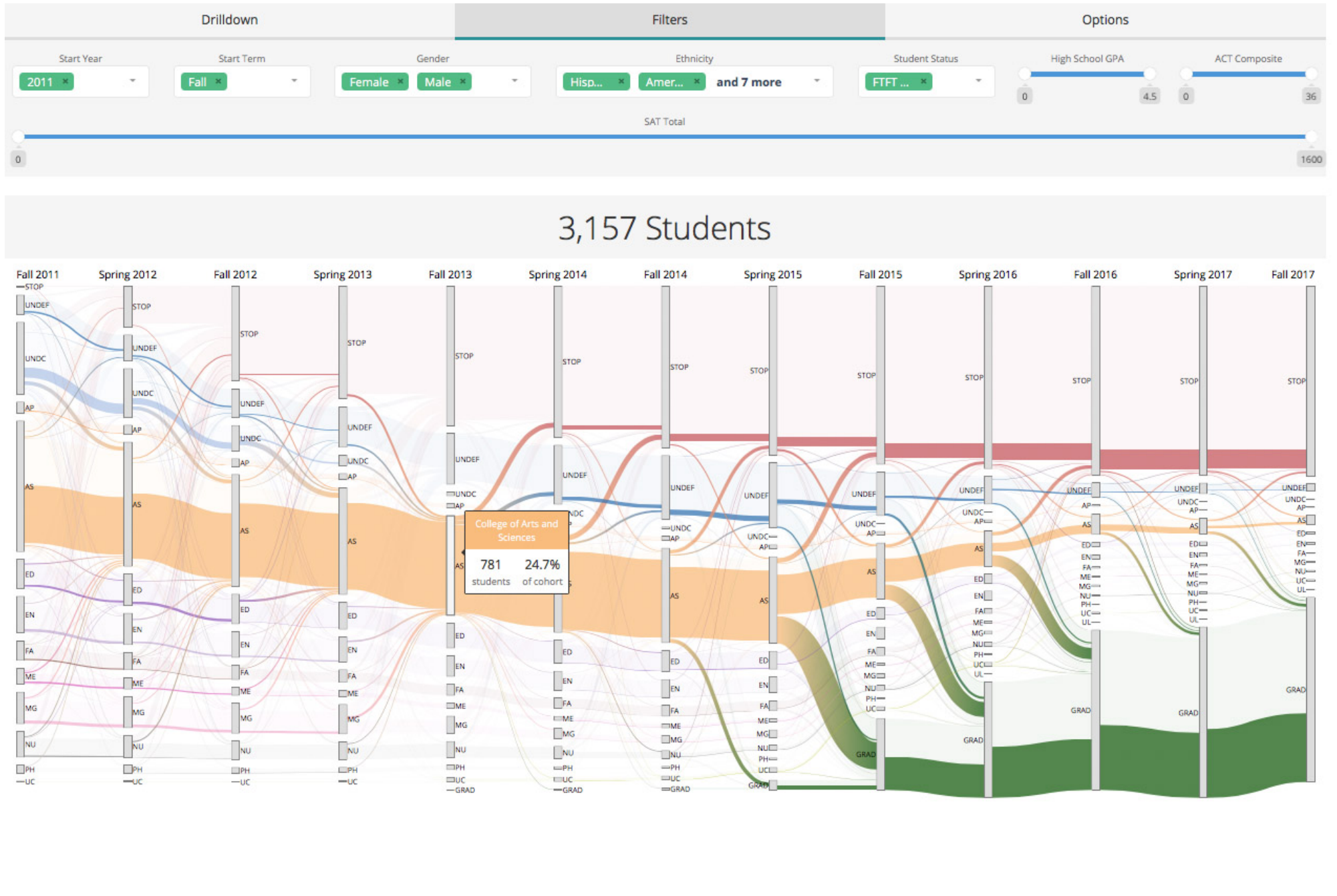


Sankey Flows

Drilldown | Filters | Options

Start Year: 2011 ×

Start Term: Fall ×

Gender: Female × Male ×

Ethnicity: Hisp... × Amer... × and 7 more

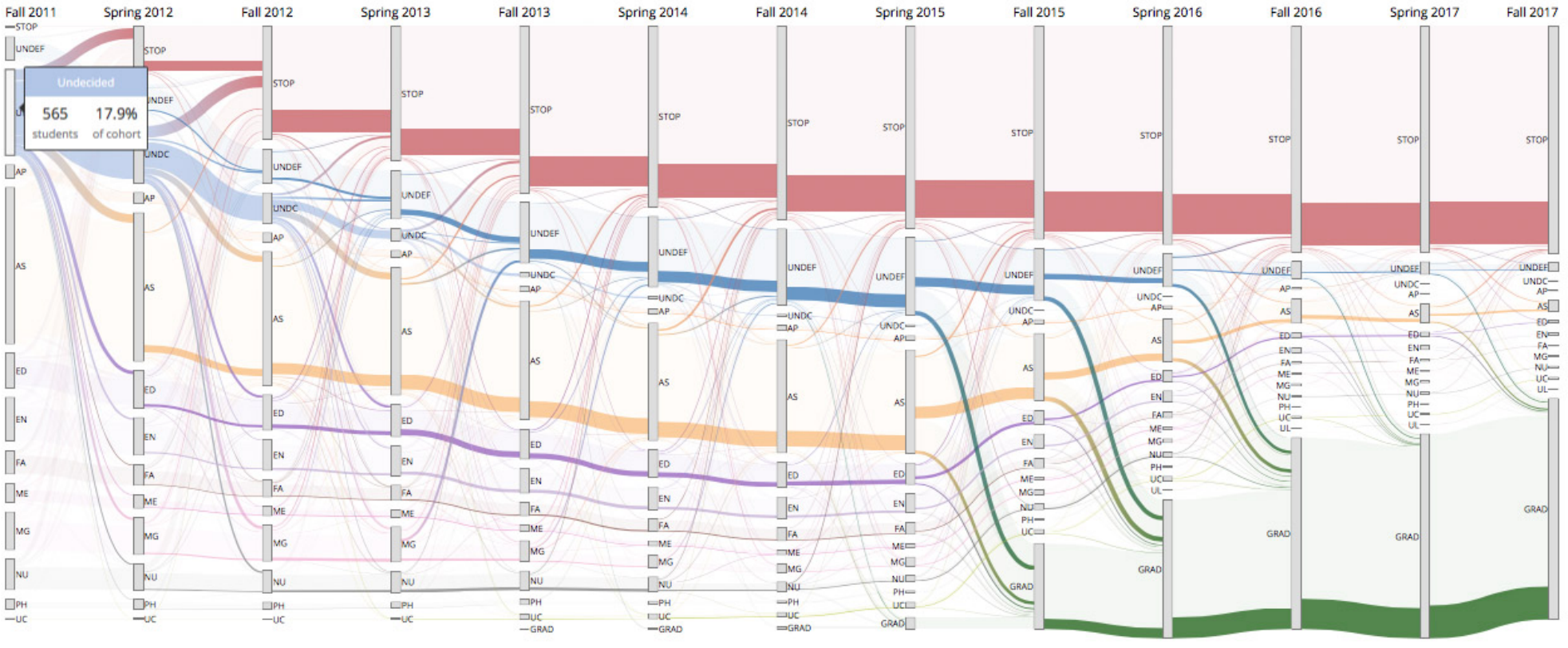
Student Status: FTFT ... ×

High School GPA: 0 – 4.5

ACT Composite: 0 – 36

SAT Total: 0 – 1600

3,157 Students



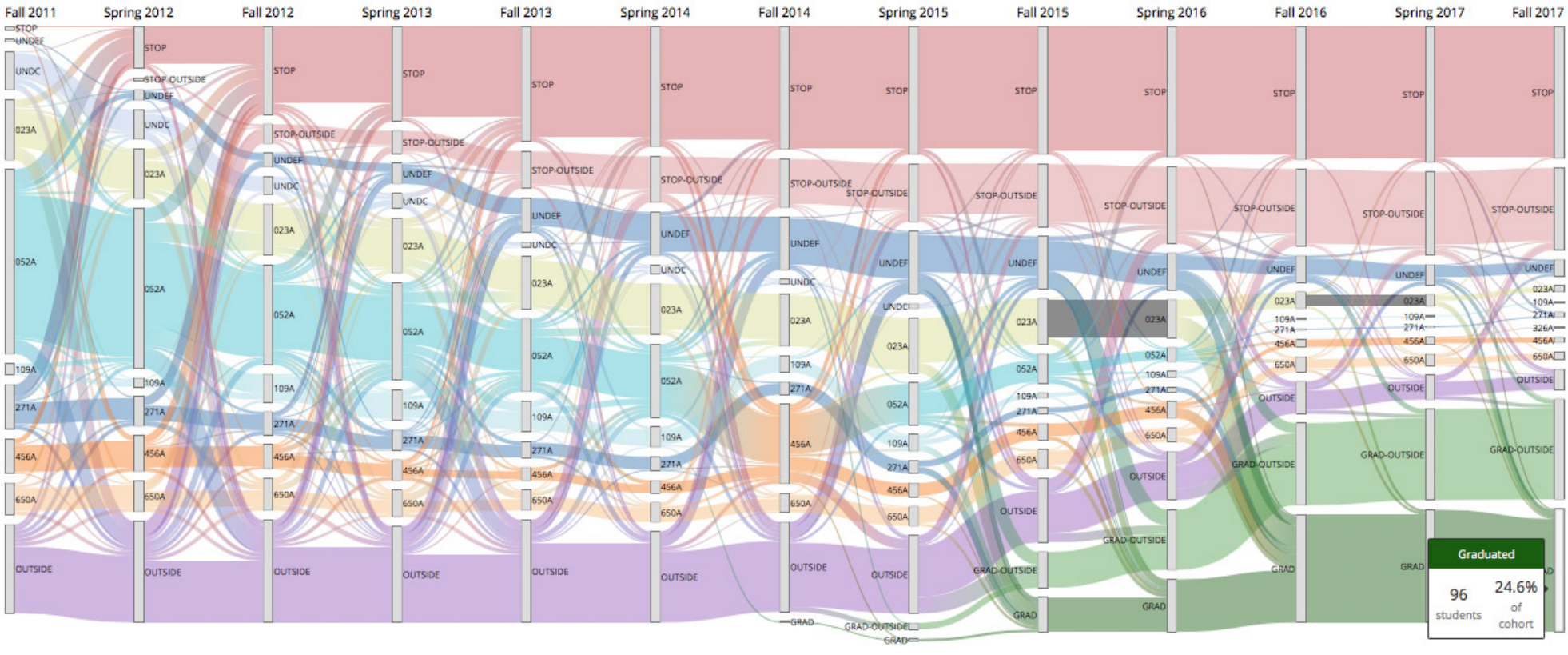
Sankey Flows

Drilldown | Filters | Options

College: EN - College of Engineering
Department: All - Departments
Major: All - Majors
Program: All - Programs

Reset

391 Students



Sankey Flows

Drilldown | Filters | Options

College: EN - College of Engineering

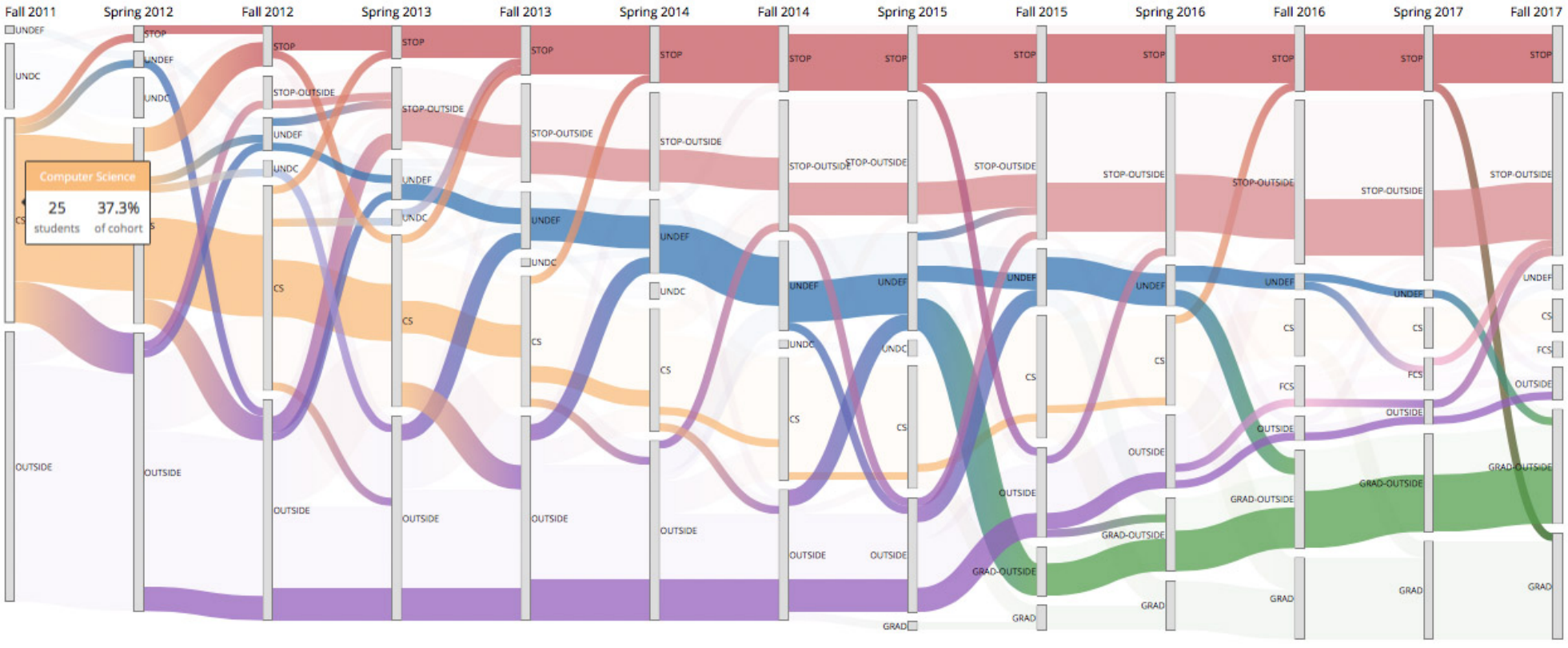
Department: 650A - Computer Science

Major: All - Majors

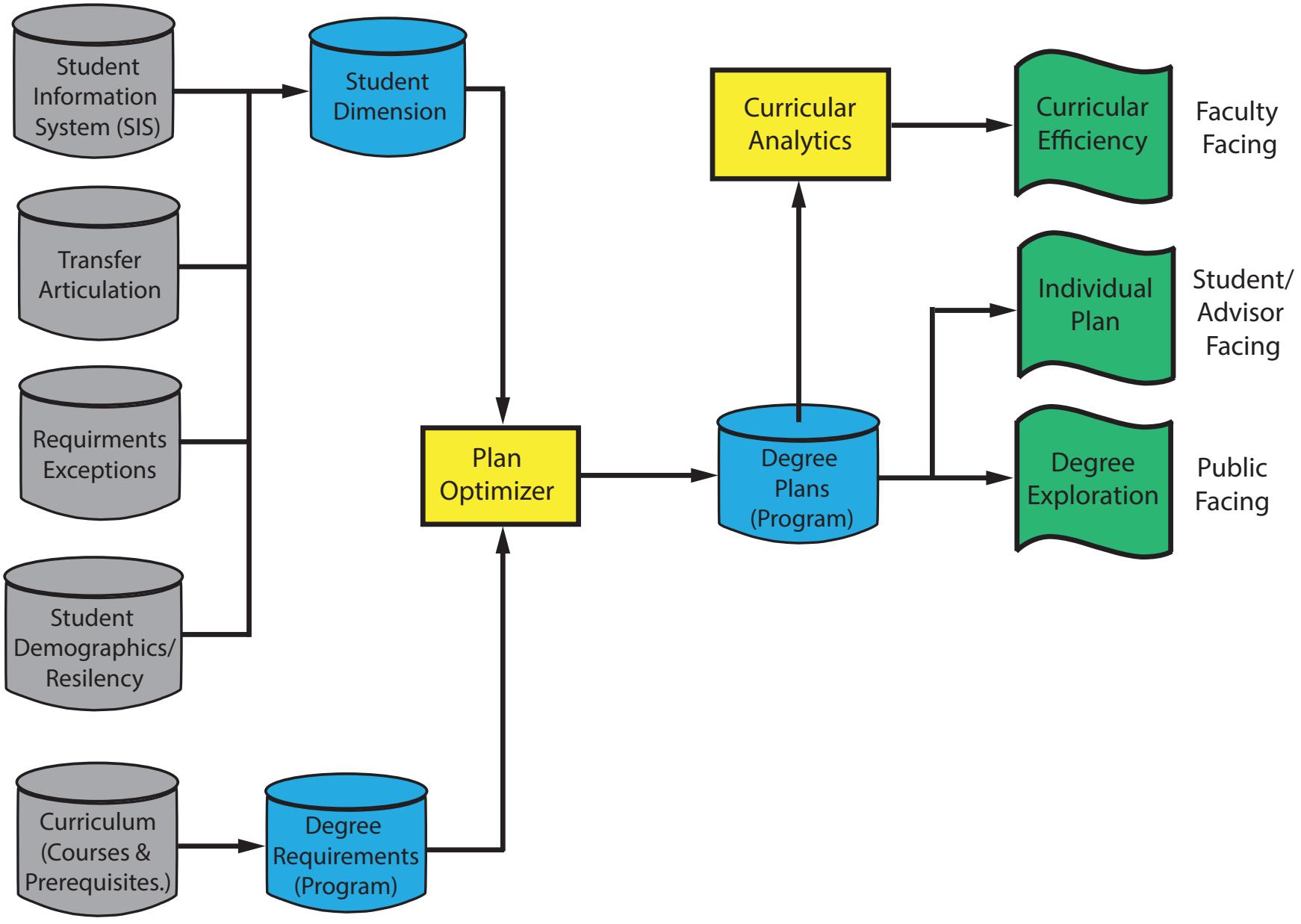
Program: All - Programs

Reset

67 Students



Analytics Journey



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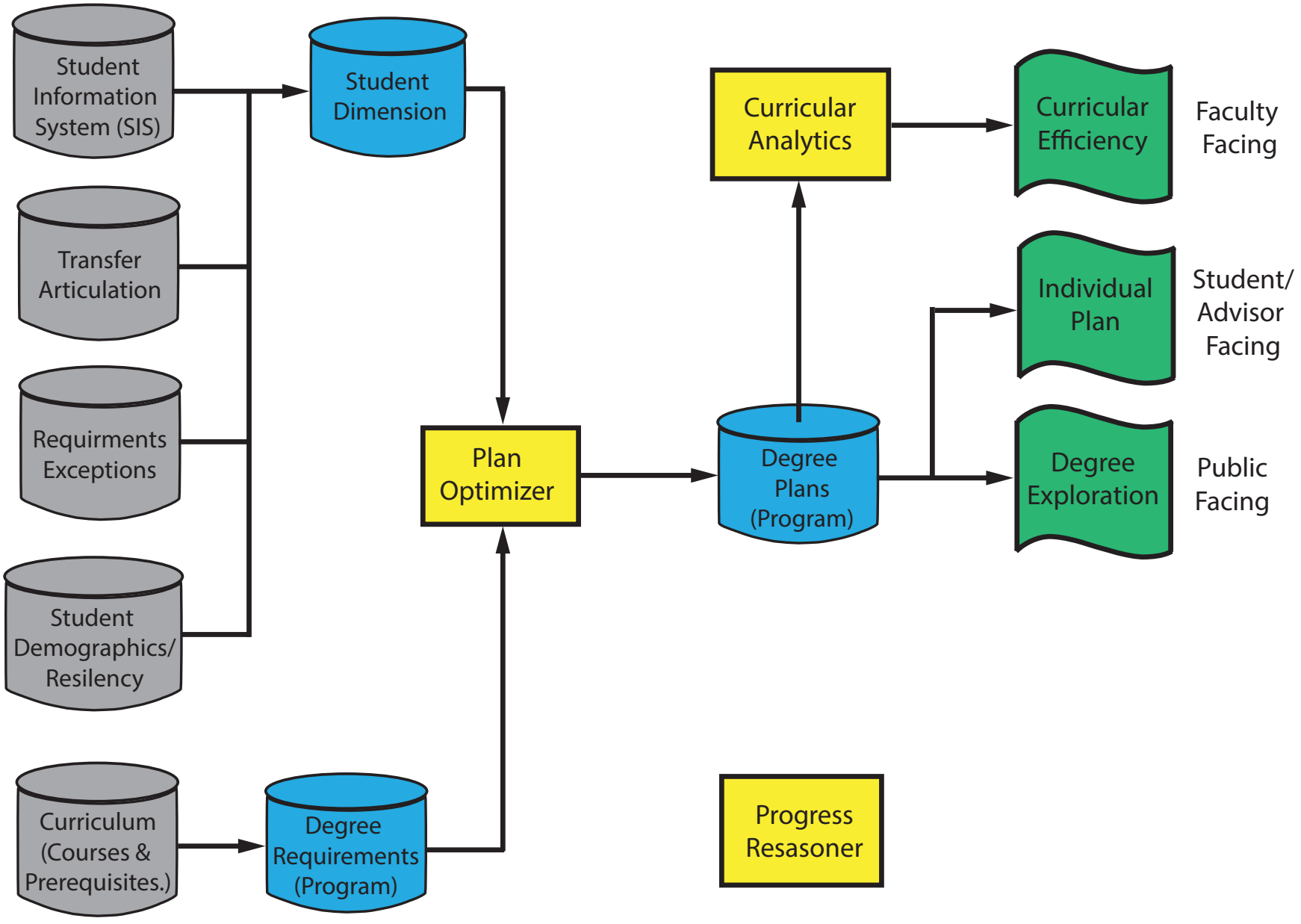

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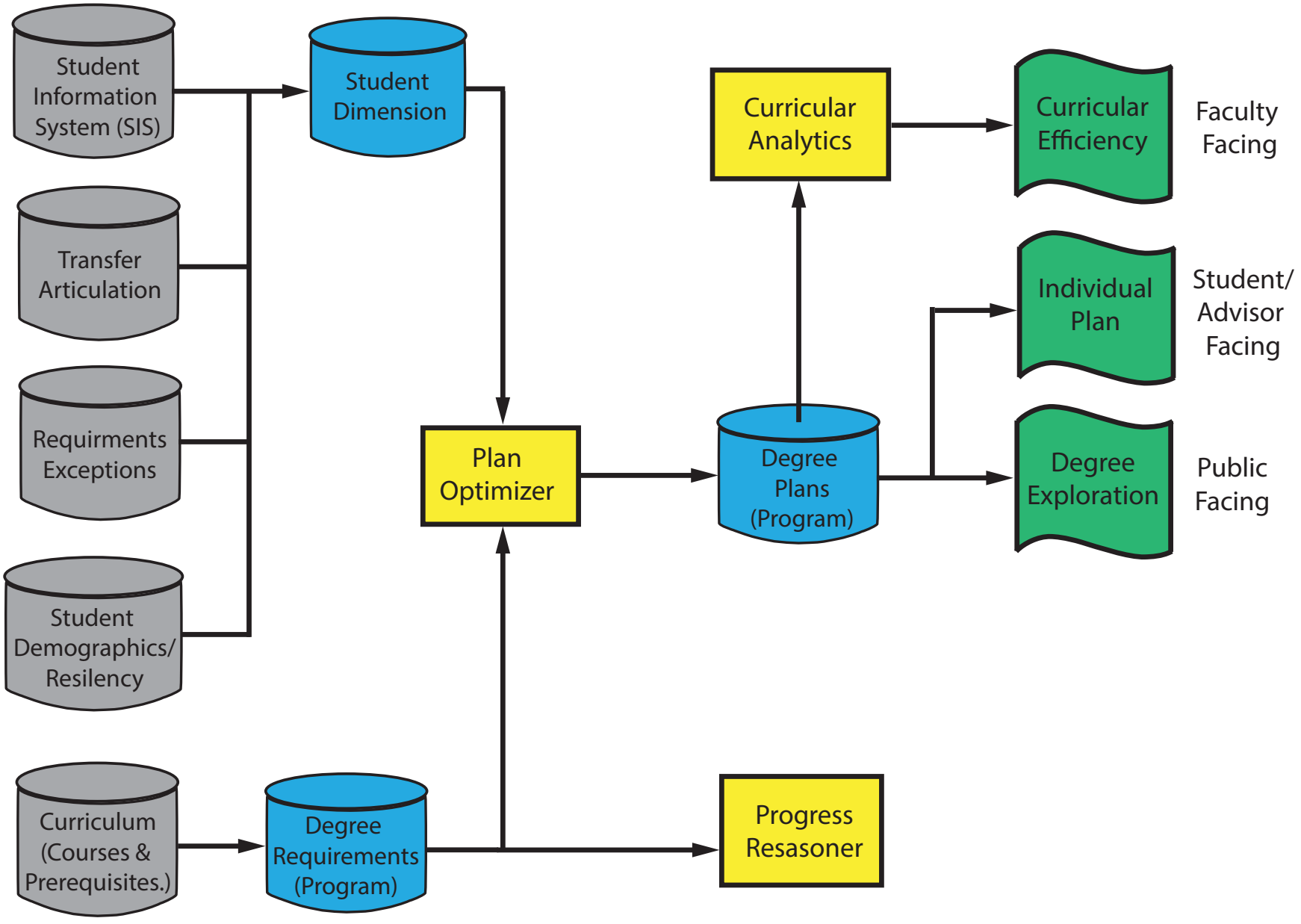

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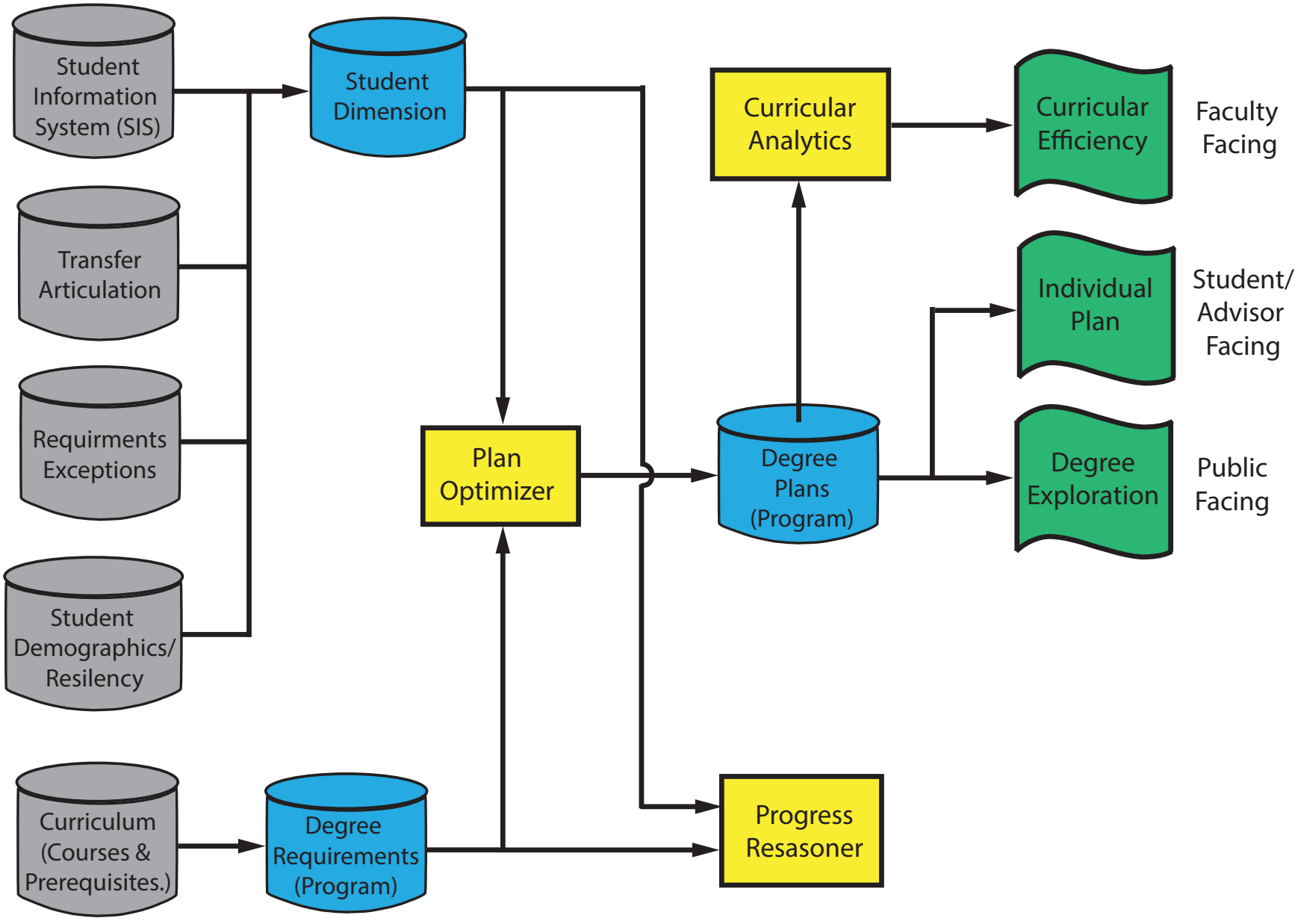

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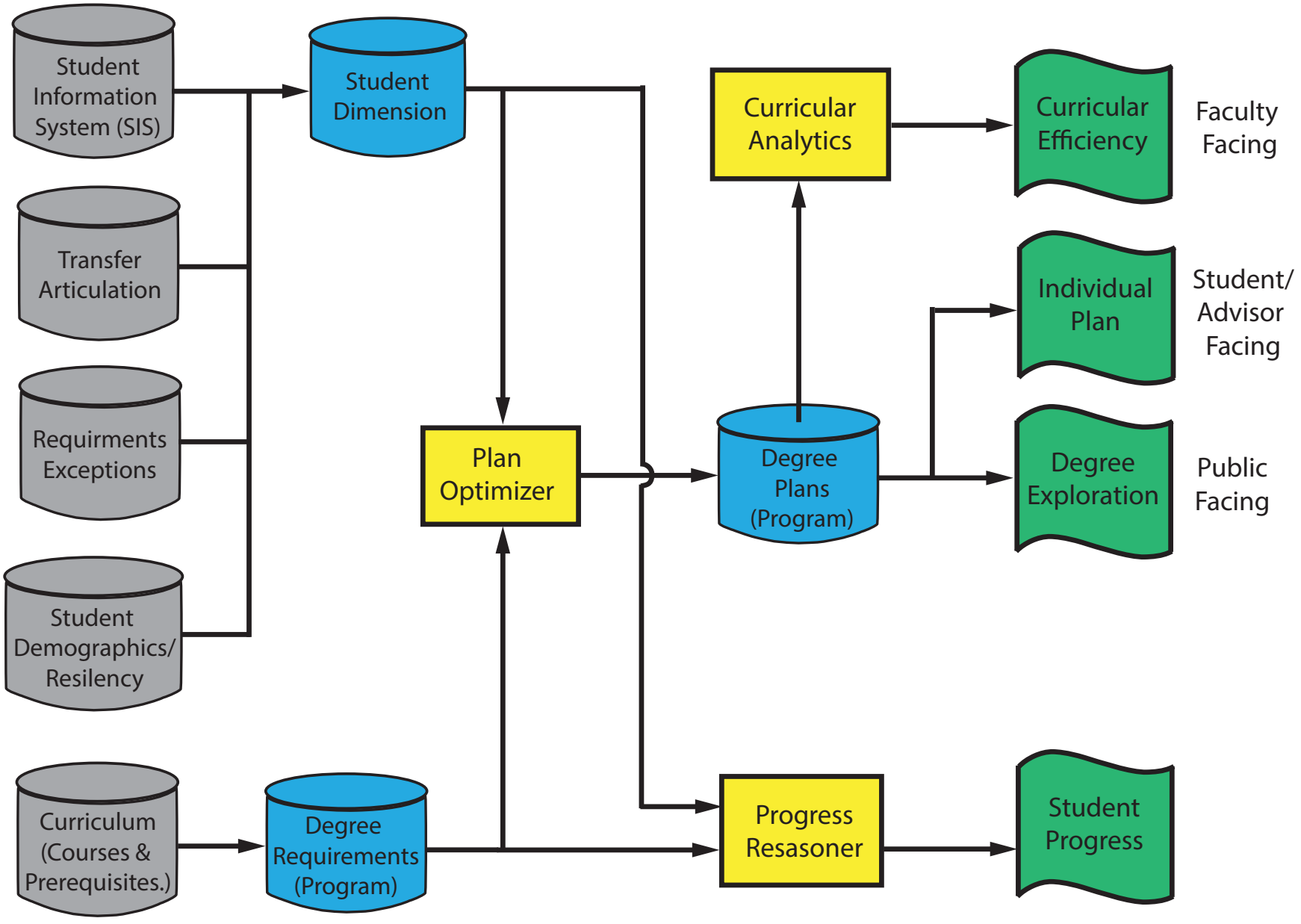

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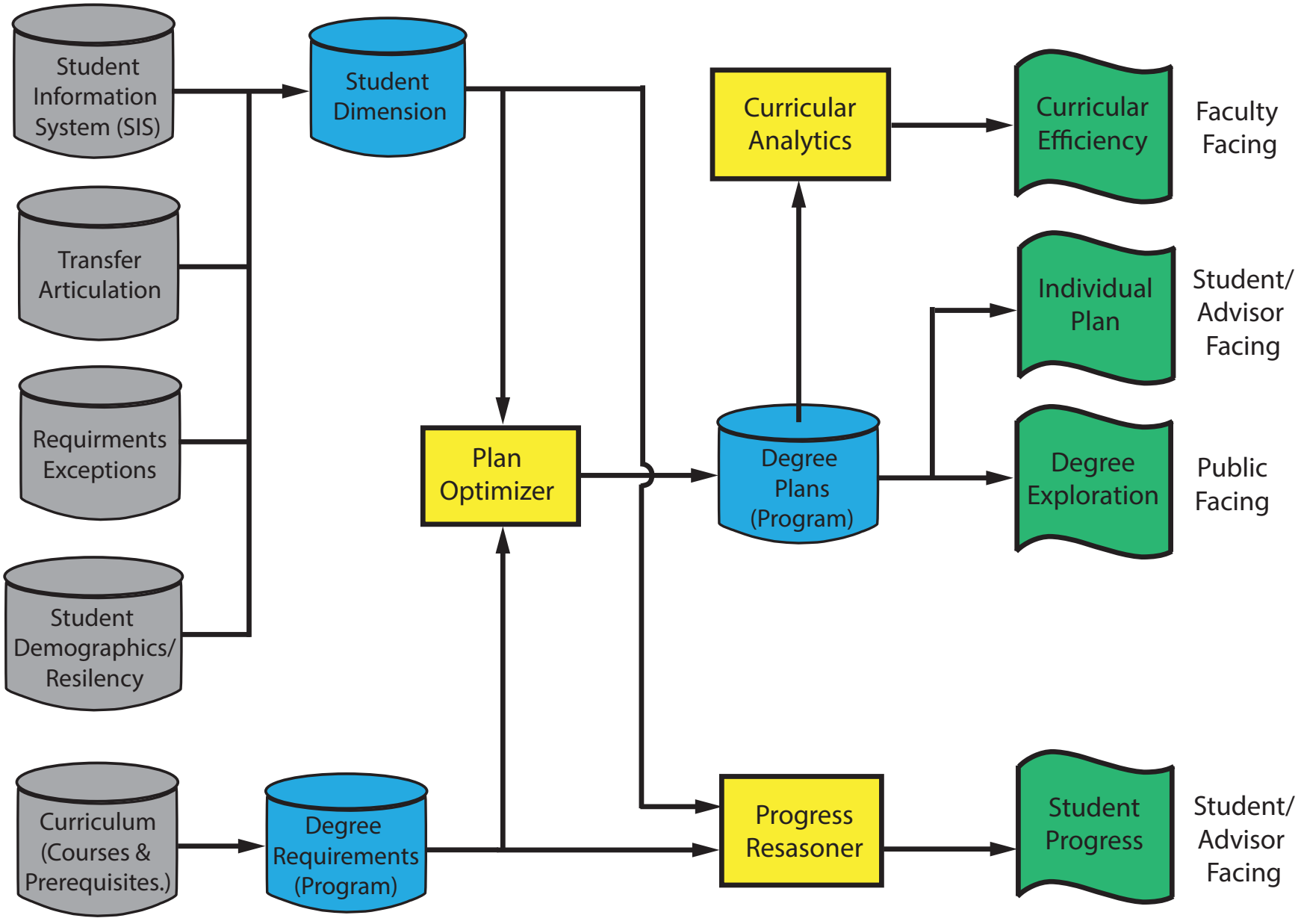

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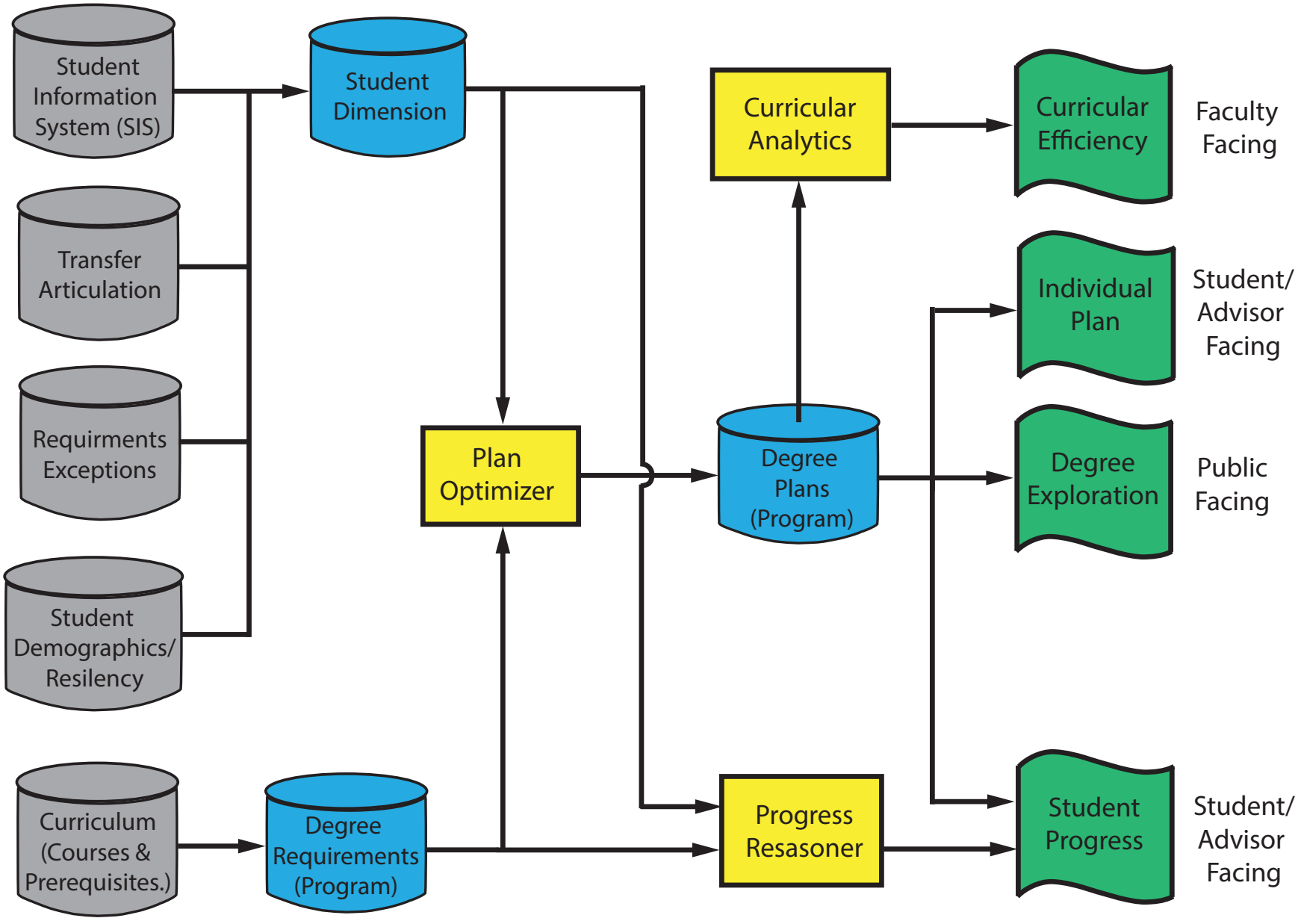


Analytics Journey

STUDENT ID: 1[redacted]8

MAJOR: Computer Engineering

MINOR: N/A

CONCENTRATION: N/A

ADMITTED TO PROGRAM	GPA	ATTEMPTED CREDIT HOURS	COMPLETION
Fall 2010	2.77	213	93%

This degree audit should be used for analysis and advising purposes only. This audit may contain errors, and should not be considered an official transcript.

EFFICIENCY RATING

53

CREDITS COUNTED TOWARDS DEGREE:	CREDITS NOT COUNTED TOWARDS DEGREE
112	101

REQUIREMENTS COMPLETED

- ECON
- Social and Behavioral Sciences
- Mathematics
- Foreign Language
- ENGL 110 or (ENGL 111 and ENGL 112) or ENGL 113
- PHYC 161L
- PHYC 160
- MATH 163
- ECE 420
- ECE 344L
- ECE 340
- ECE 330
- ECE 206L
- ECE 203
- Fine Arts
- Physical and Natural Sciences
- Humanities
- ENGL 219 or ENGL 220 or CJ 130 or PHIL 156 or UHON 201
- Tech Elective
- PHYC 161
- ENGL 219
- ECE 440
- ECE 419
- ECE 331
- ECE 314
- ECE 213
- ECE 238L
- ECE 231

Analytics Journey

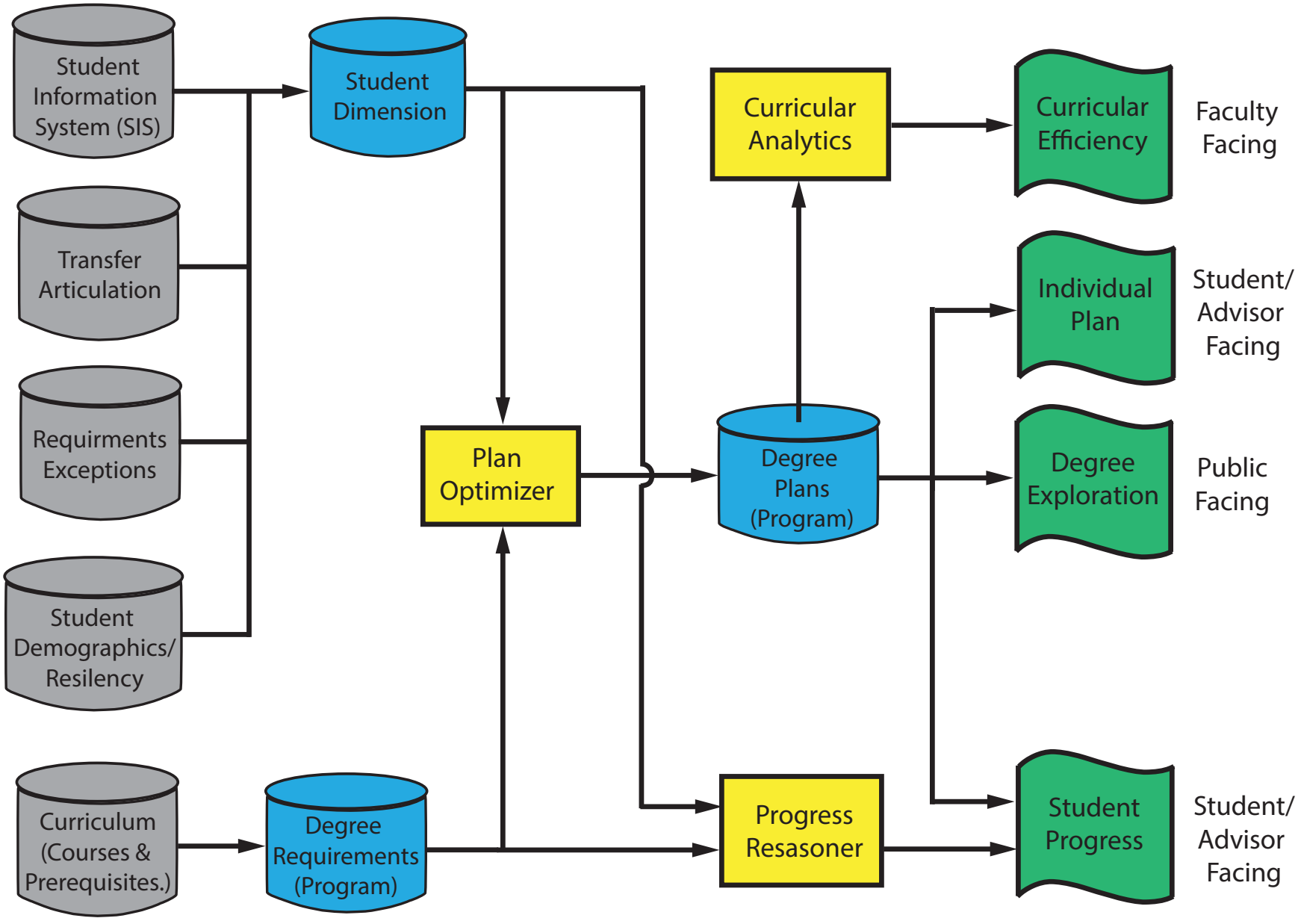
REQUIREMENTS NOT COMPLETED

- MATH 162
- ECE 300
- ECE 321L

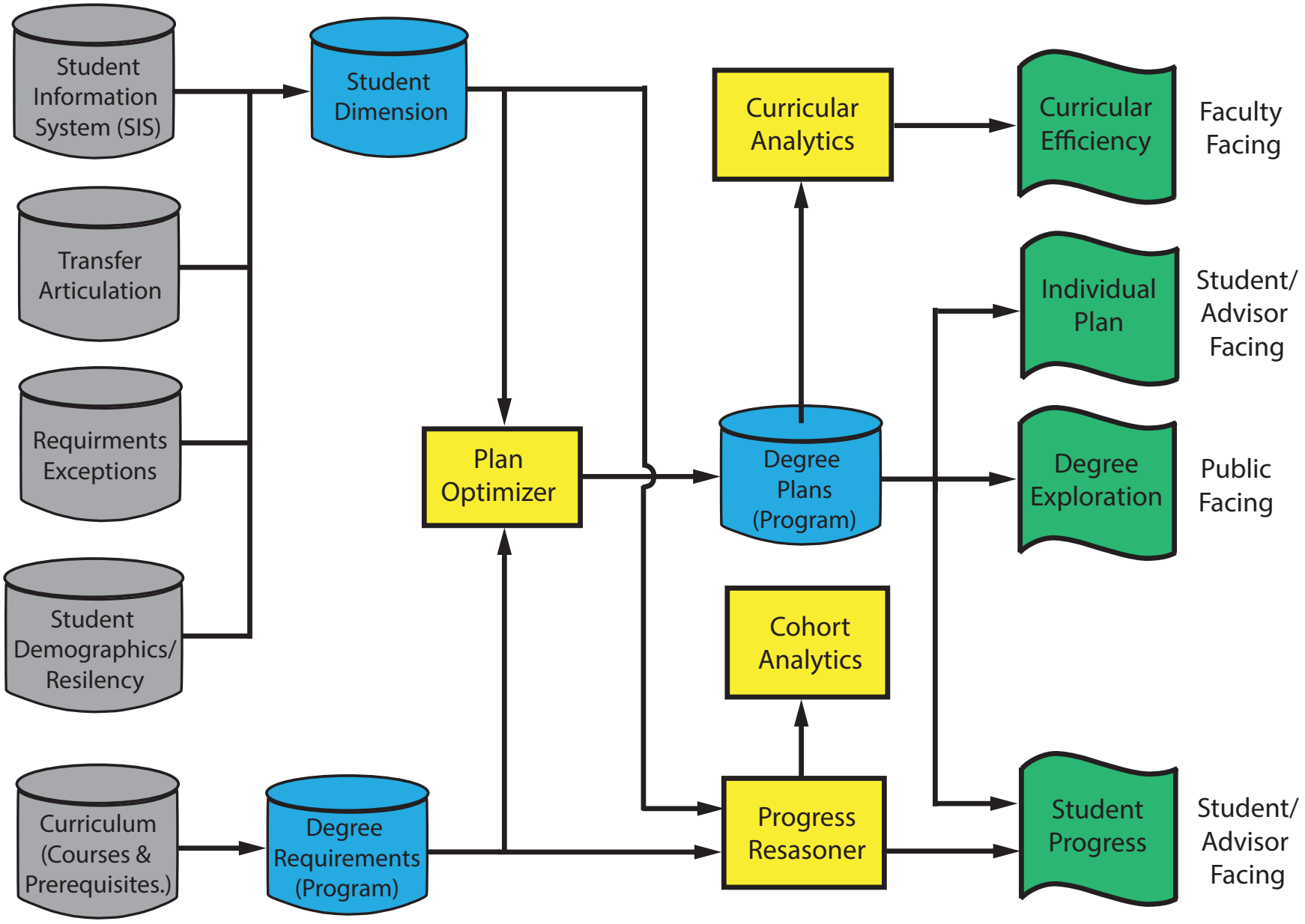
COURSES NOT COUNTED

CS 105L: A	Not applicable towards degree	UNIV 101: A+	Not applicable towards degree
THEA 130: A	Not applicable towards degree	MATH 123: C+	Not applicable towards degree
PENP 114: B-	Not applicable towards degree	PENP 101: A-	Not applicable towards degree
CS 151L: A	Not applicable towards degree	MATH 120: B-	Not applicable towards degree
PENP 115: A+	Not applicable towards degree	MATH 150: D	Grade Not Sufficient
ECOP 105: CR	Grade Not Sufficient	SPAN 212: F	Grade Not Sufficient
MATH 264: D+	Grade Not Sufficient	MATH 121: D	Grade Not Sufficient
ECE 213: IF	Grade Not Sufficient	PSY 105: C-	Grade Not Sufficient
PHYC 168: CR	Grade Not Sufficient	CHEM 111L: NC	Grade Not Sufficient
MATH 101: A	Transfered Course	MATH 150: WP	Withdrew
CHEM 111: WF	Withdrew	ECE 340: W	Withdrew
ECE 437: W	Withdrew	MATH 264: W	Withdrew
MATH 264: W	Withdrew	MATH 327: W	Withdrew
CS 152L: W	Withdrew	ECE 203: W	Withdrew
ENGL 102: WP	Withdrew	ARTH 101: W	Withdrew
MATH 327: W	Withdrew	MATH 121: WP	Withdrew
MATH 123: WP	Withdrew	ANTH 101: W	Withdrew
ECE 412: W	Withdrew	ECE 345: W	Withdrew

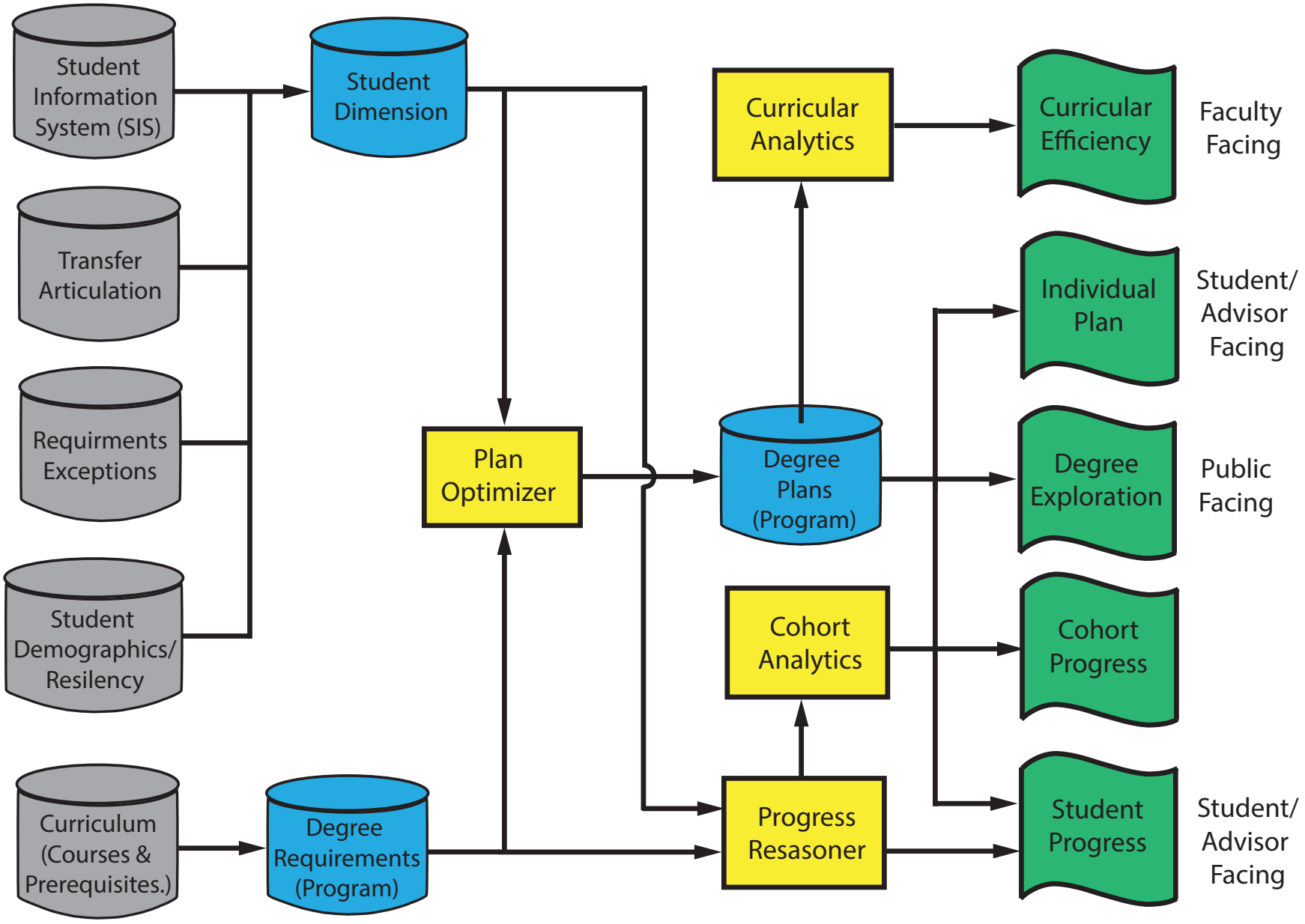
Analytics Journey



Analytics Journey



Analytics Journey



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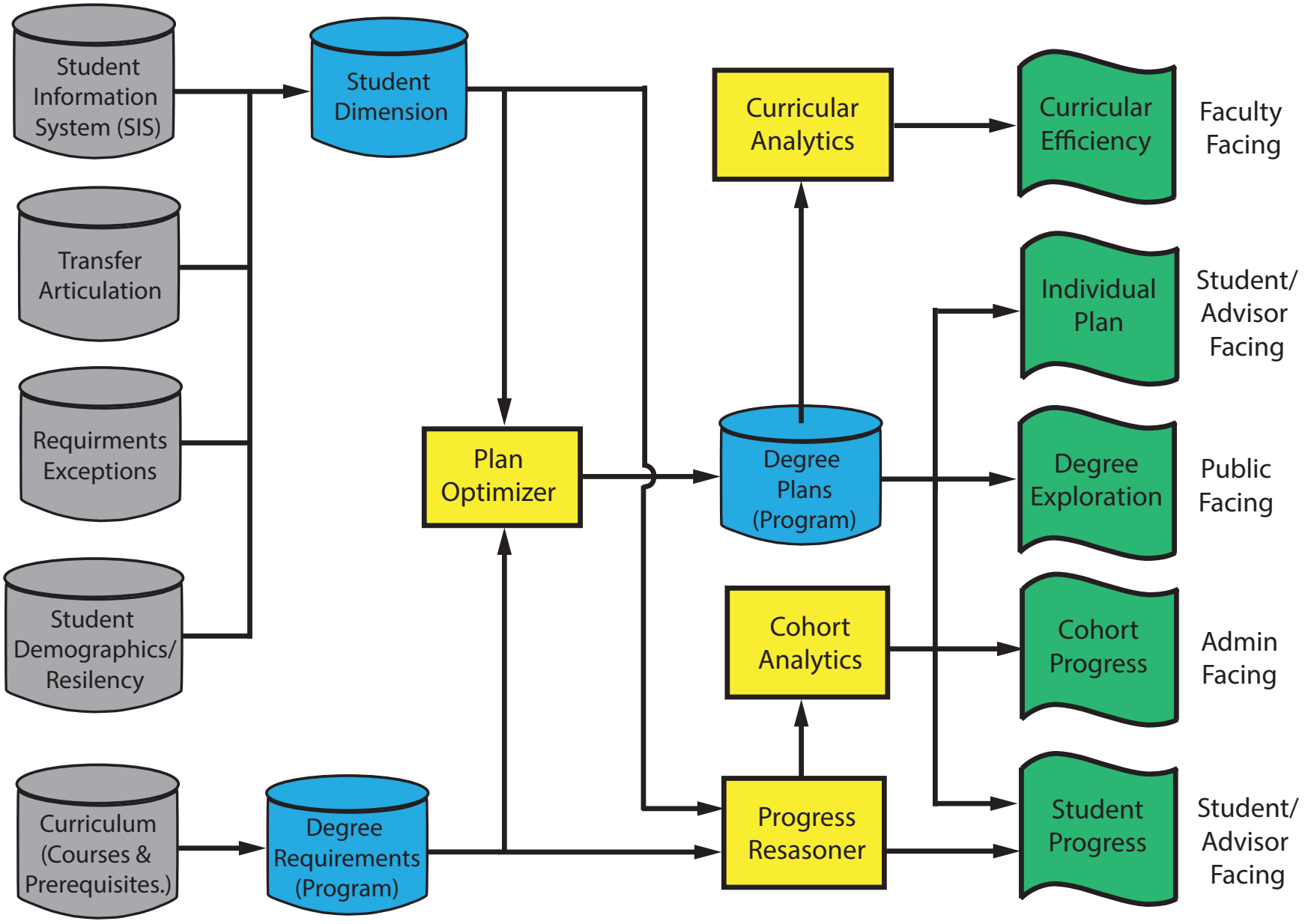


Analytics Journey

COLLEGE OF FINE ARTS

This dashboard is meant to be used for cohort analytics purposes only. As the data may contain errors, it should not be used as an official audit of student progress. All analytics are computed relative to the 2015-2016 academic year.

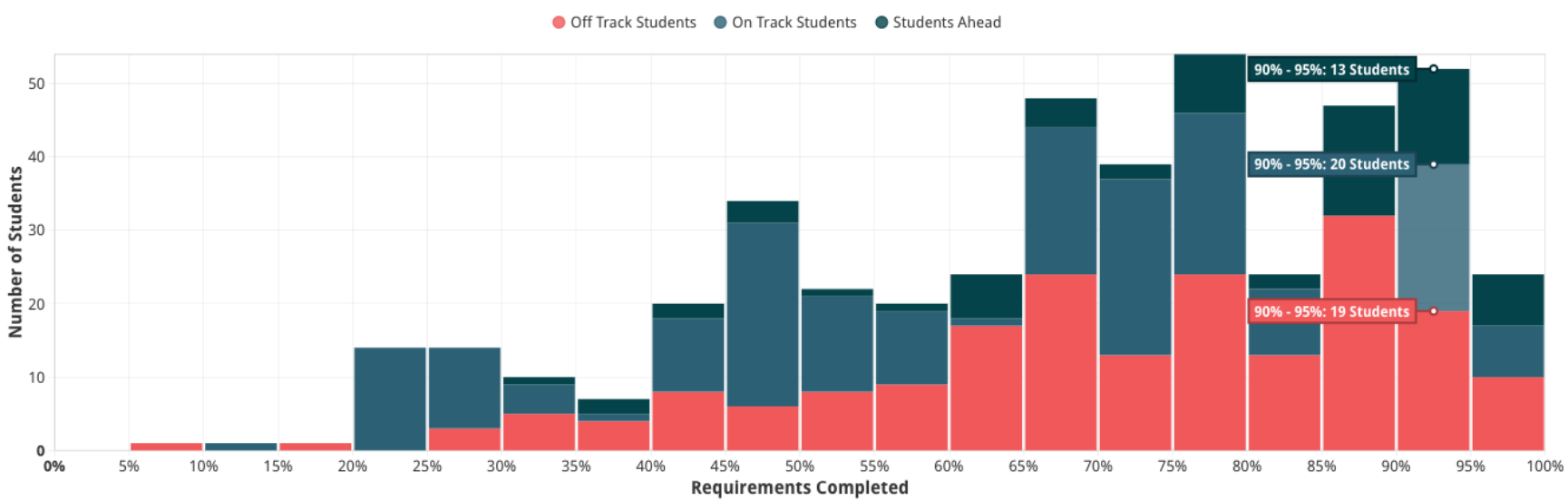
STUDENTS	AVERAGE GPA	AVERAGE CREDIT HOURS	AVERAGE COMPLETION
456	3.46	110	68%

EFFICIENCY RATING

80

AVG CREDITS COUNTED TOWARDS DEGREE:	AVG CREDITS NOT COUNTED TOWARDS DEGREE
88	22

STUDENT PROGRESS HISTOGRAM



Analytics Journey

SCHOOL OF ENGINEERING

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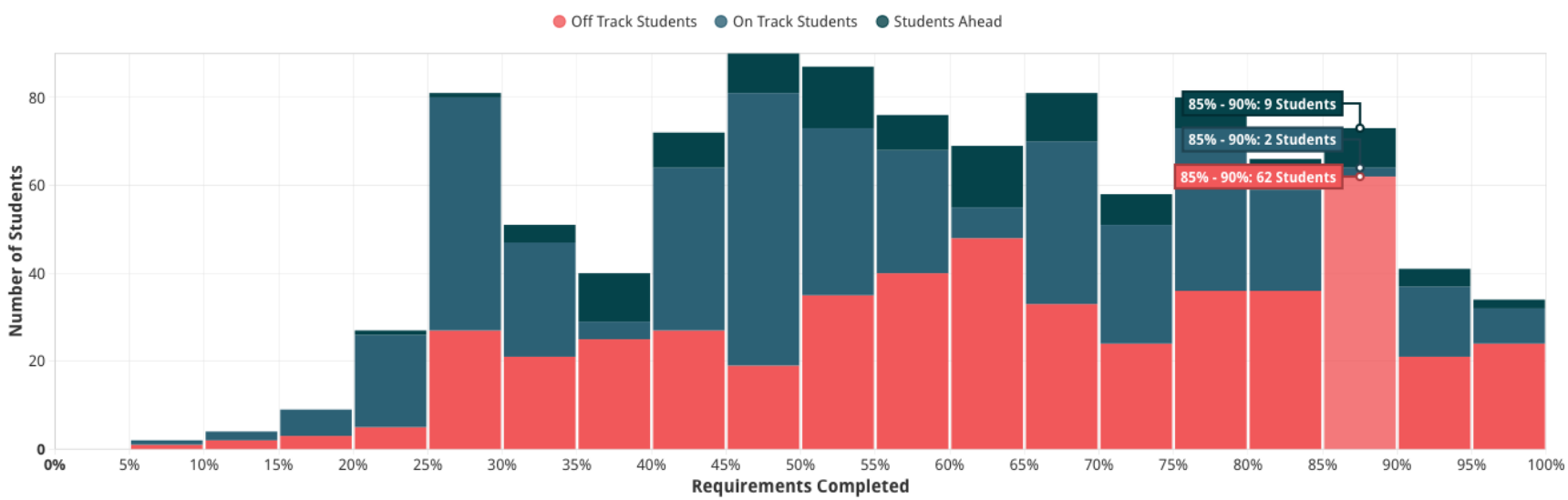
STUDENTS	AVERAGE GPA	AVERAGE CREDIT HOURS	AVERAGE COMPLETION
1006	3.46	124	61%

EFFICIENCY RATING

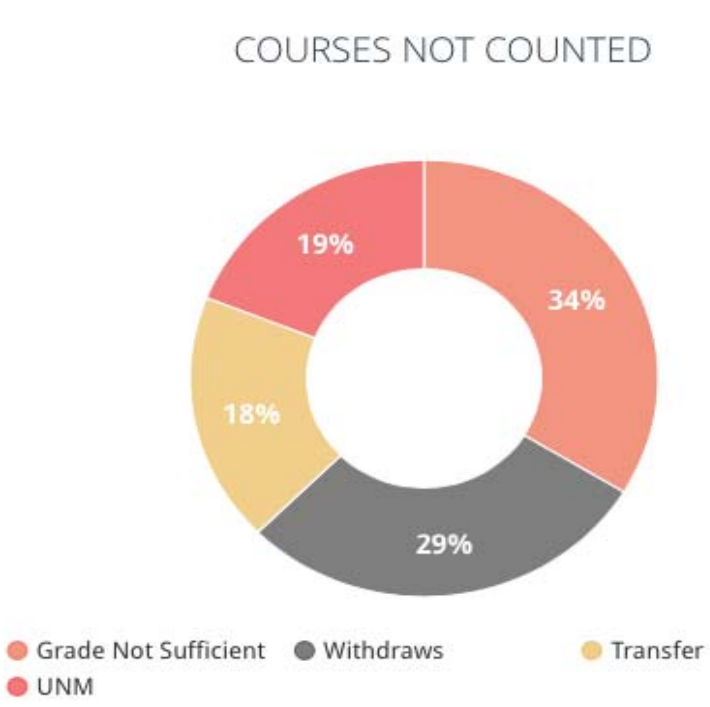
61

AVG CREDITS COUNTED TOWARDS DEGREE:	AVG CREDITS NOT COUNTED TOWARDS DEGREE
75	49

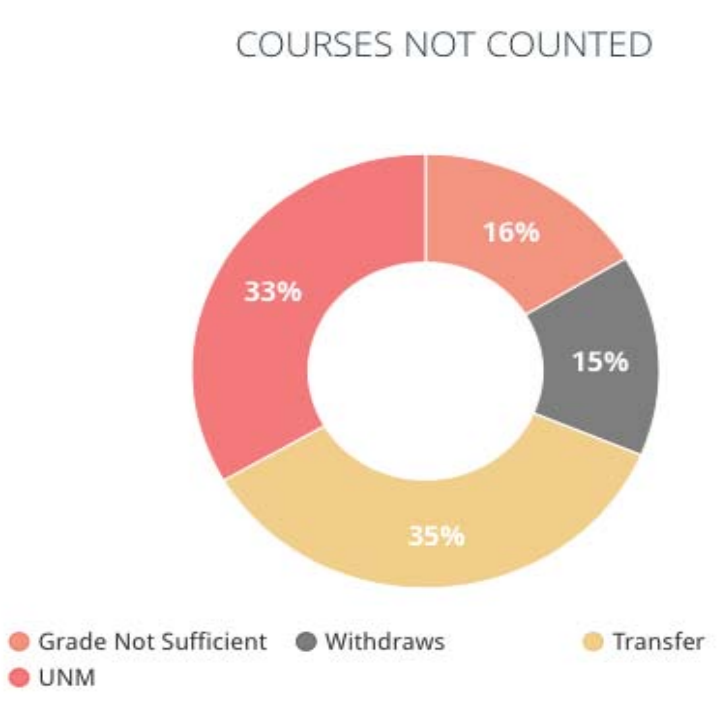
STUDENT PROGRESS HISTOGRAM



Analytics Journey



Fine Arts



Engineering

Analytics Journey

Grade Not Sufficient

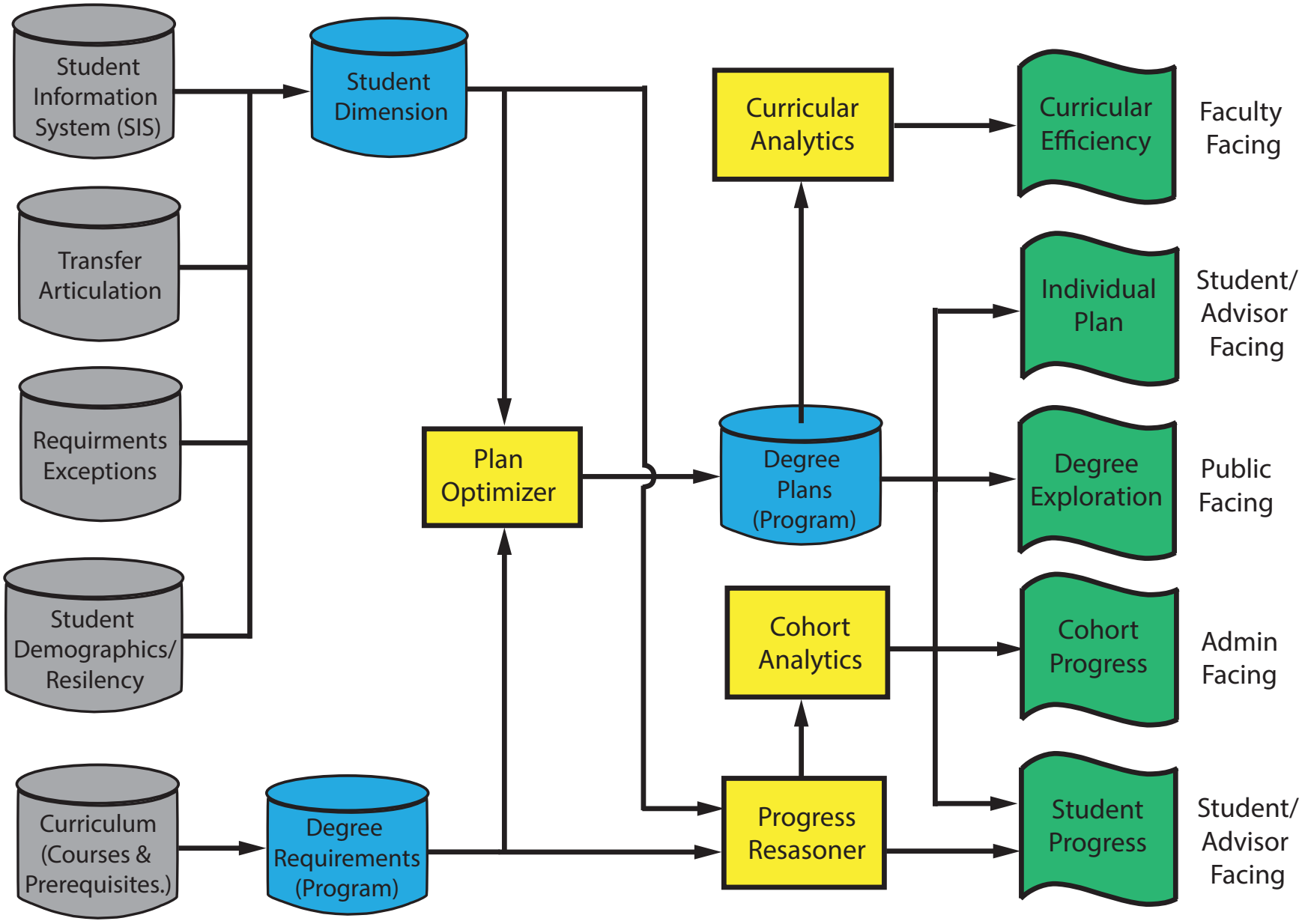
Course	Count
MUS 101	75
ISM 100	47
ARTS 123	44
MUS 214	24
HIST 101	19
ENVS 101	19
SOC 101	19
MUSE 215	19

Fine Arts

Course	Count
PHYC 167	250
PHYC 168	149
ECOP 105	130
MATH 163	115
MATH 264	109
MATH 162	106
PHYC 161	77
PHYC 160	71

Engineering

Analytics Journey



Analytics for Action

Action Analytics versus Reporting Analytics:

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Action Analytics versus Reporting Analytics:

- Reporting analytics need to ... be correct, or you might get in trouble.

IPEDS 2017-18 Data Collection System

IPEDS Help Desk
(877) 225-2568 or ipedshelp@rti.org

NCES National Center for Education Statistics

Statutory Requirements for Reporting IPEDS Data

General Mandate

NCES is authorized by law under the Section 153 of the Education Sciences Reform Act of 2002 (P.L. 107-279). Accordingly, NCES "shall collect, report, analyze, and disseminate statistical data related to education in the United States and in other nations, including -

- collecting, acquiring, compiling (where appropriate, on a state by state basis), and disseminating full and complete statistics on the condition and progress of education, at the pre-school, elementary, secondary, and postsecondary levels in the United States, ...;
- conducting and publishing reports and analyses of the meaning and significance of such statistics;
- collecting, analyzing, cross-tabulating, and reporting, to the extent feasible, so as to provide information by gender, race, ...; and
- assisting public and private educational agencies, organizations, and institutions in improving and automating statistical and data collection activities..."

Mandatory Reporting for Institutions with Program Participation Agreements

The completion of all IPEDS surveys, in a timely and accurate manner, is mandatory for all institutions that participate in or are applicants for participation in any Federal financial assistance program authorized by Title IV of the Higher Education Act (HEA) of 1965, as amended. The completion of the surveys is mandated by 20 USC 1094, Section 487(a)(17) and 34 CFR 668.14(b)(19).

The Department of Education relies on postsecondary institutions to accurately report data to IPEDS, and nearly all institutions do. Institutions themselves sometimes identify misreporting issues and work with ED to correct those problems without the need for further action by the Department. The Department is concerned about any instances of intentional or significant misreporting. Under these circumstances, the Office of Federal Student Aid may take administrative action to appropriately address the issue.

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Takeaway #4: Student success is about action analytics

Takeaways

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- **Analytics is storytelling**
- **Analytics should inform strategies and tactics, not initiate them**
- **Analytics is a process, not a product**
- **Action analytics – point you in the right direction**

Questions?