



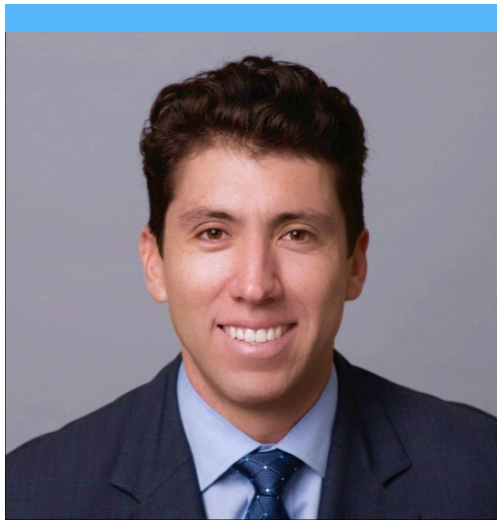
GRAYTM
DECISION INTELLIGENCE

Master Class 4: Advanced Analytics and AI in Higher Education

March 26th, 2024

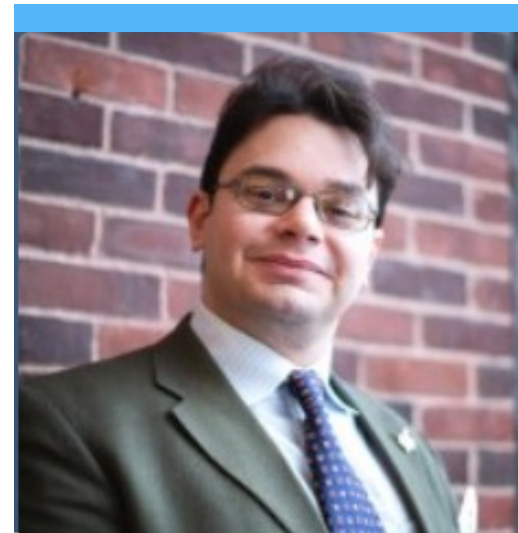


Today's Presenters



Zach Paz

**EVP, Product
Chief Operating Officer**



Youssef Aljabi

Manager, Data Science and Product



Advanced Analytics and Artificial Intelligence in Higher Education



Budget and Planning

Value Proposition and Pricing
Enrollment Probability and Forecasting
Predict Program Size
Pro Forma Financials



Operations and Marketing

Location Optimization
Geographic Marketing Optimization



Academics

Skills Trends and Gap Analysis
Generative AI



Agenda

Overview

Value Proposition and Pricing

Location and Geographic Marketing Optimization

Skills Trends and Gap Analysis

Enrollment Forecasting

Predict Program Size with Pro Forma Financials

Generative AI



Value Proposition and Pricing

How will changes to our value proposition and pricing affect program demand and margin?

- What value elements are most important to students?
- How price-sensitive is the market?





Value Proposition and Pricing

- Competitor Benchmarking
- Student Preference Research
 - MaxDiff
 - TURF
 - Discrete Choice
- Decision Support System

Generate Ideas for Value Elements

- Leadership, faculty, staff, students, prospects, competition

Screen “Long List”

- “Simple” student surveys
- Leadership reviews

Decide on Short List of Value Elements

Estimate Economics of Value Elements

- Discrete Choice Survey
- Economic Model

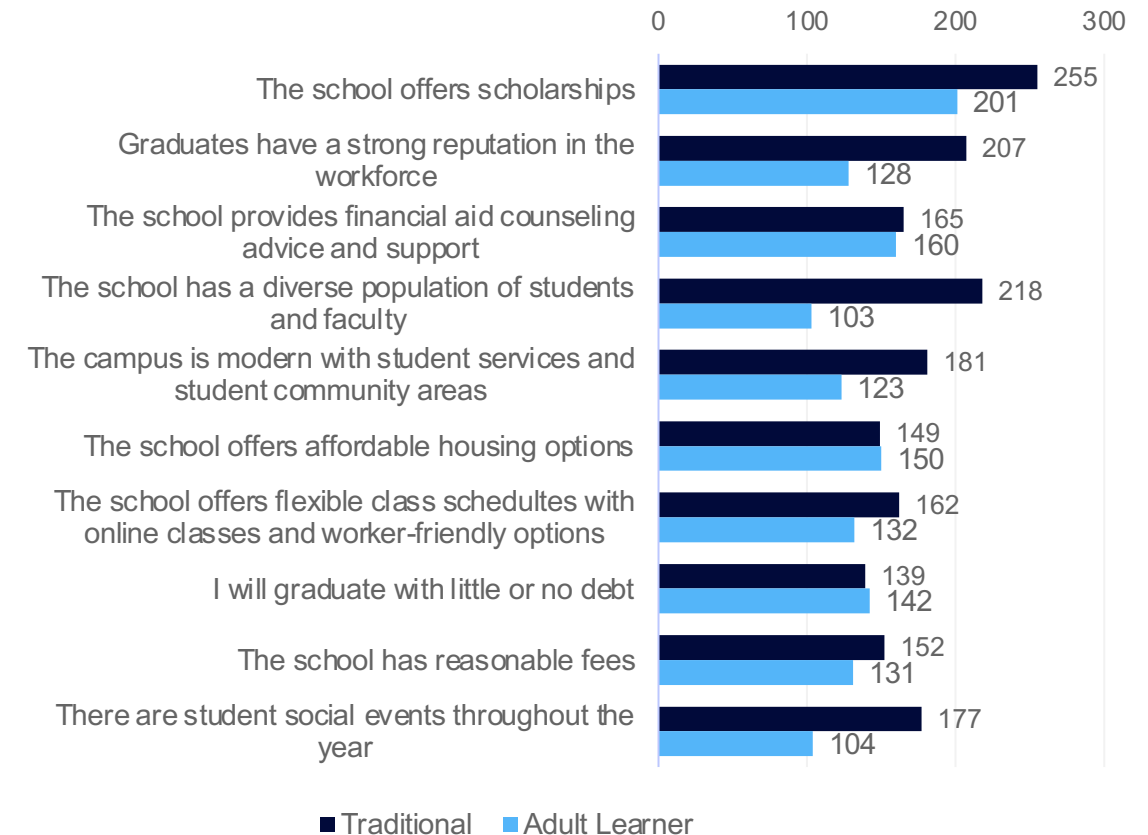
Develop and Model Value Propositions

Value Proposition and Pricing: MaxDiff

- Please consider the potential benefits of an **online Master's** degree program. Thinking about your needs and preferences, please select the:
- ONE** benefit that is **MOST APPEALING**, that would MOST motivate you to consider applying to a school, and the
- ONE** benefit that is **LEAST APPEALING**, that would LEAST motivate you to consider applying to a school.

MOST Appealing Please Check ONE	Benefits of Master's Program	LEAST Appealing Please Check ONE
	One-to-one teaching	
	Physical residency required	✓
	Program length: 24 months	
✓	Weekly course starts	
	Small scholarship	

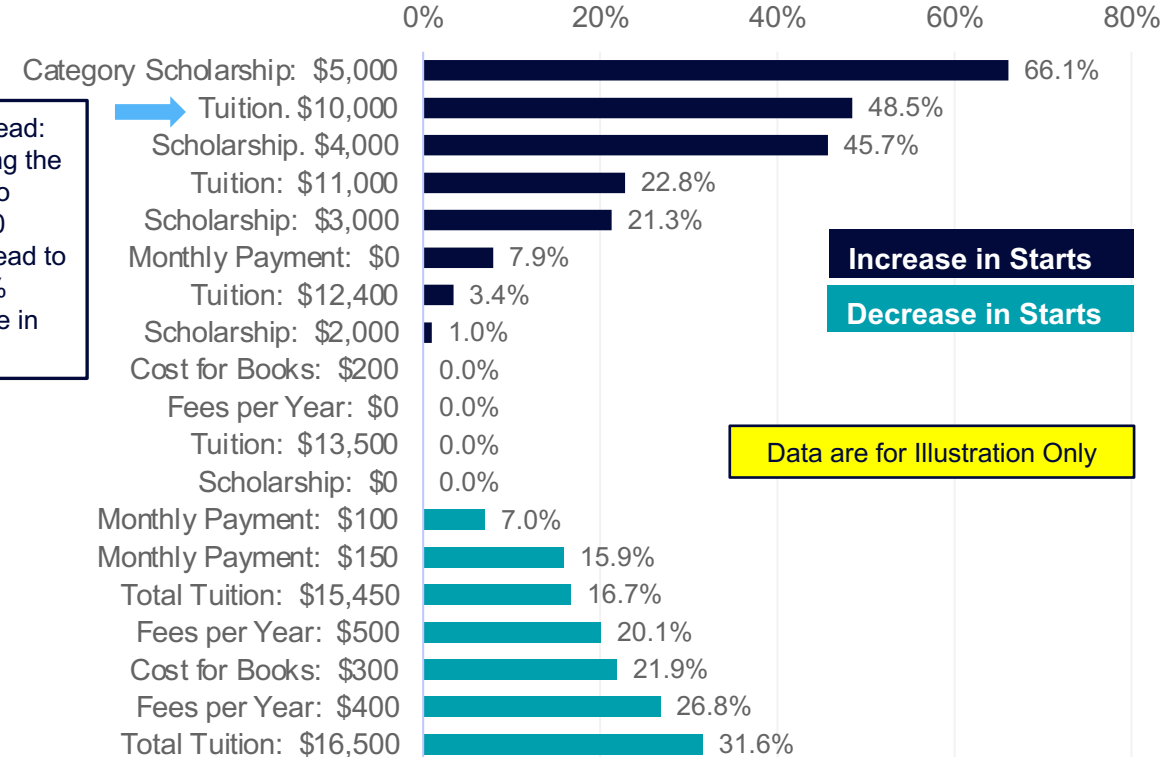
Most Appealing Features Variations by Student Type Index Score (Centered at 100)



Value Proposition and Pricing: Discrete Choice

Cost and Features	Institution A	Institution B
Total Tuition	\$55,000	\$62,000
Program Fees	\$1,500	None
Scholarship	\$2,000	\$5,000
Industry Experienced Faculty	Yes	Yes
Accreditation	Accreditation A	Accreditation B
Program Modality	On-Ground and Hybrid Options	Online with Immersion
Employer Relationship	No	Sponsored Career Fair
Campus Facilities	Best in Class	Standard
Best for you →	<input type="radio"/>	<input checked="" type="radio"/>
Would you really consider enrolling in the program selected?	<input type="radio"/> Yes	<input type="radio"/> No

Demand Sensitivity % Change in Starts



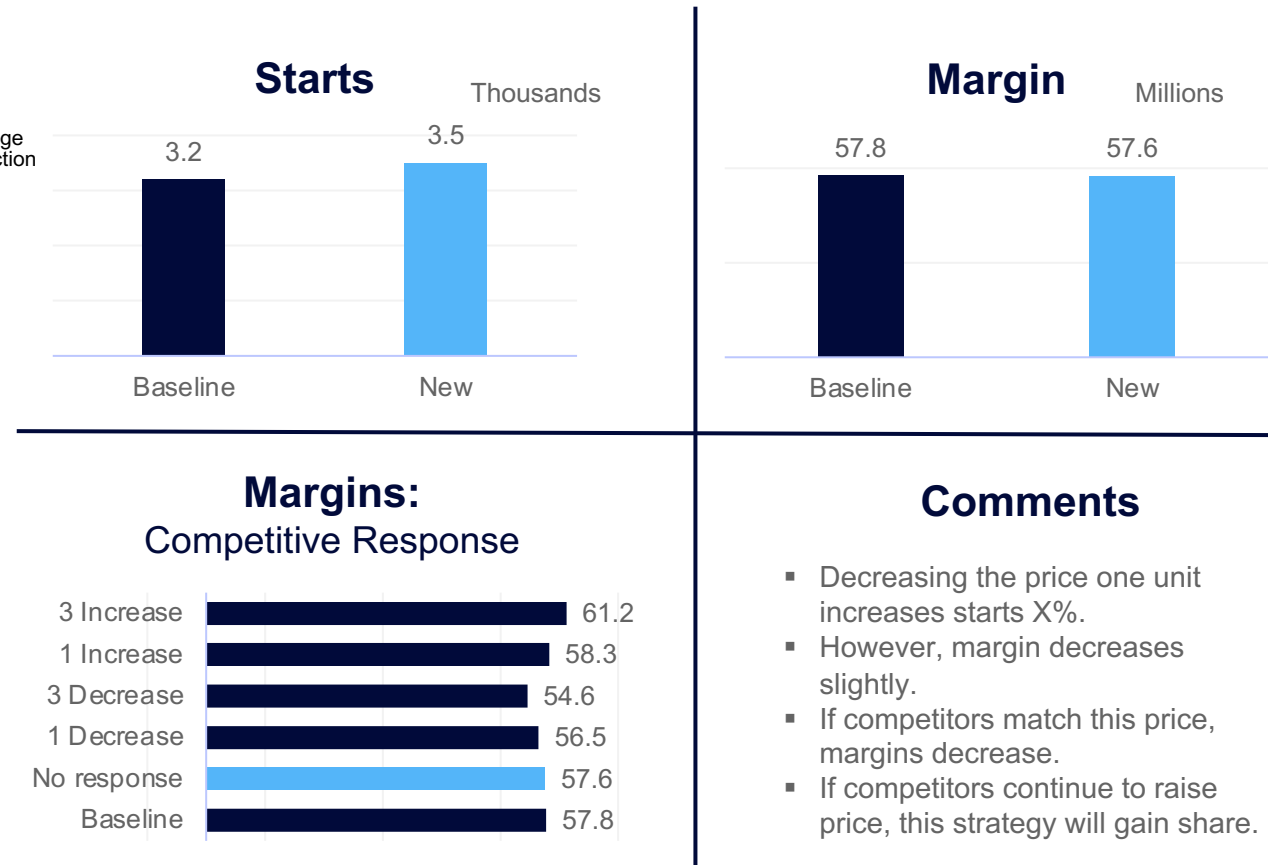
Value Proposition and Pricing: Decisions Support System

Attributes	CCC	Brand B	Brand C	Brand D
Total Program Tuition	\$11,200	\$12,500	\$16,300	\$18,000
Fees	\$300	\$0	\$500	\$350
Books	\$500	\$0	\$250	\$250
Program Duration (Months)	18	12	18	18
Hours Per Week	8	12	10	9
Required Campus Visits Per week	2	0	3	3
Scholarship	2	0	3	3

	CCC	Brand B	Brand C	Brand D
Est. Market Share	15%	25%	9%	8%
Est. Starts	990			
Est. Margin (\$Millions)	\$11.9			

Change Selection

Data are for Illustration Only





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Location Selection

What is the best site for a new campus or regional center?

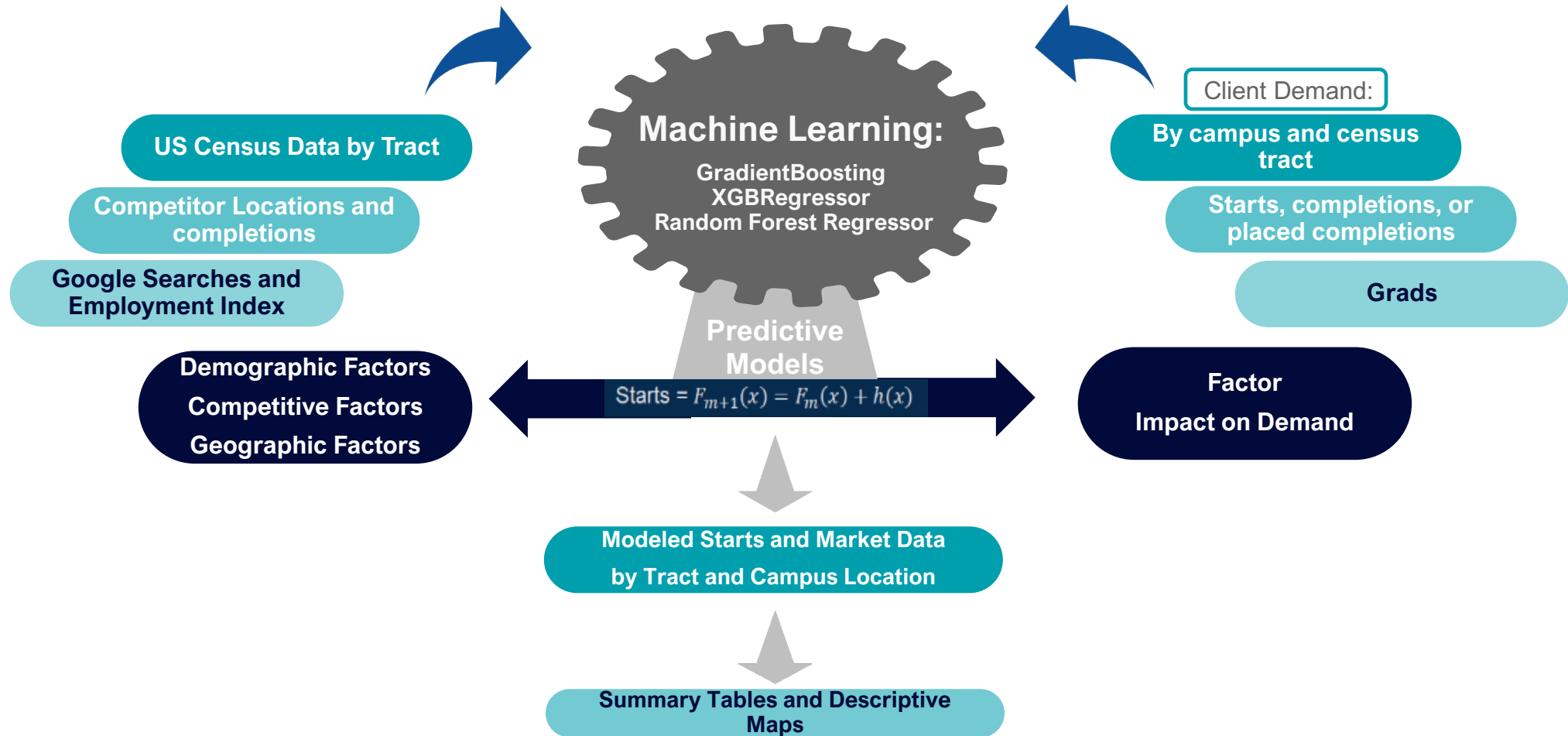
- Evaluate new locations with your current footprint in mind.
- Cannibalization may influence the overall performance of adding a new campus.
- Often, distance and drivetime are major factors for enrollment.

<https://www.artnews.com/art-news/product-recommendations/best-map-pins-1234585155/>





Location Selection Methodology

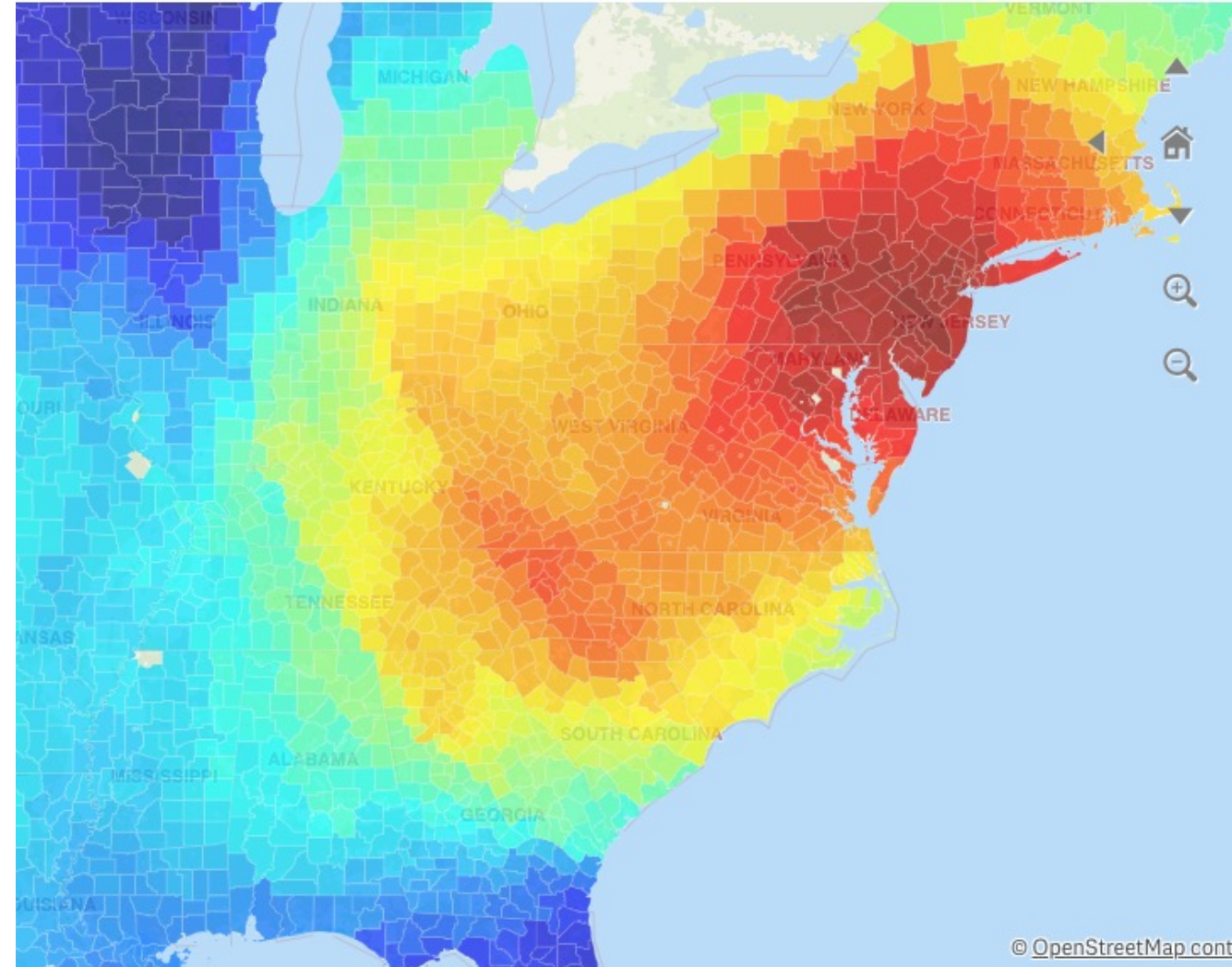




Location Selection Output

Mapping the results helps visualize the opportunity and tradeoffs.

- Things to consider:
 - Available sites
 - Competitor locations
 - Convenience
 - Crime





Marketing Optimization

Where should I target program marketing and recruiting resources to maximize returns?

- Evaluate lead opportunity by market.
- Identify spend thresholds by market.
- Simulate spend and lead outcomes.



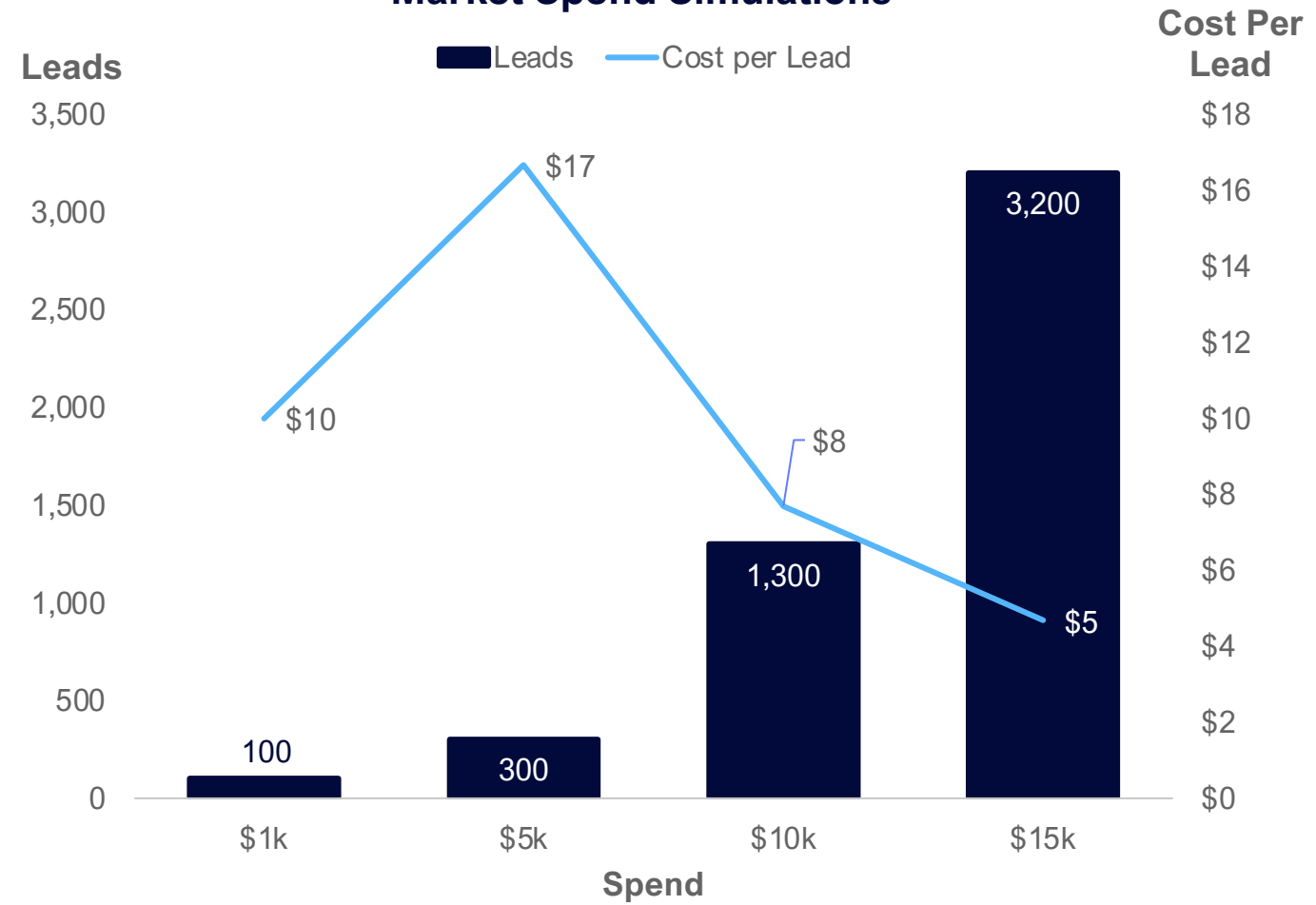


Marketing Optimization Output

Simulate spend by geography.

- Identify spend requirements and thresholds in each market.
- Spend more efficiently by reducing cost per lead.

Market Spend Simulations





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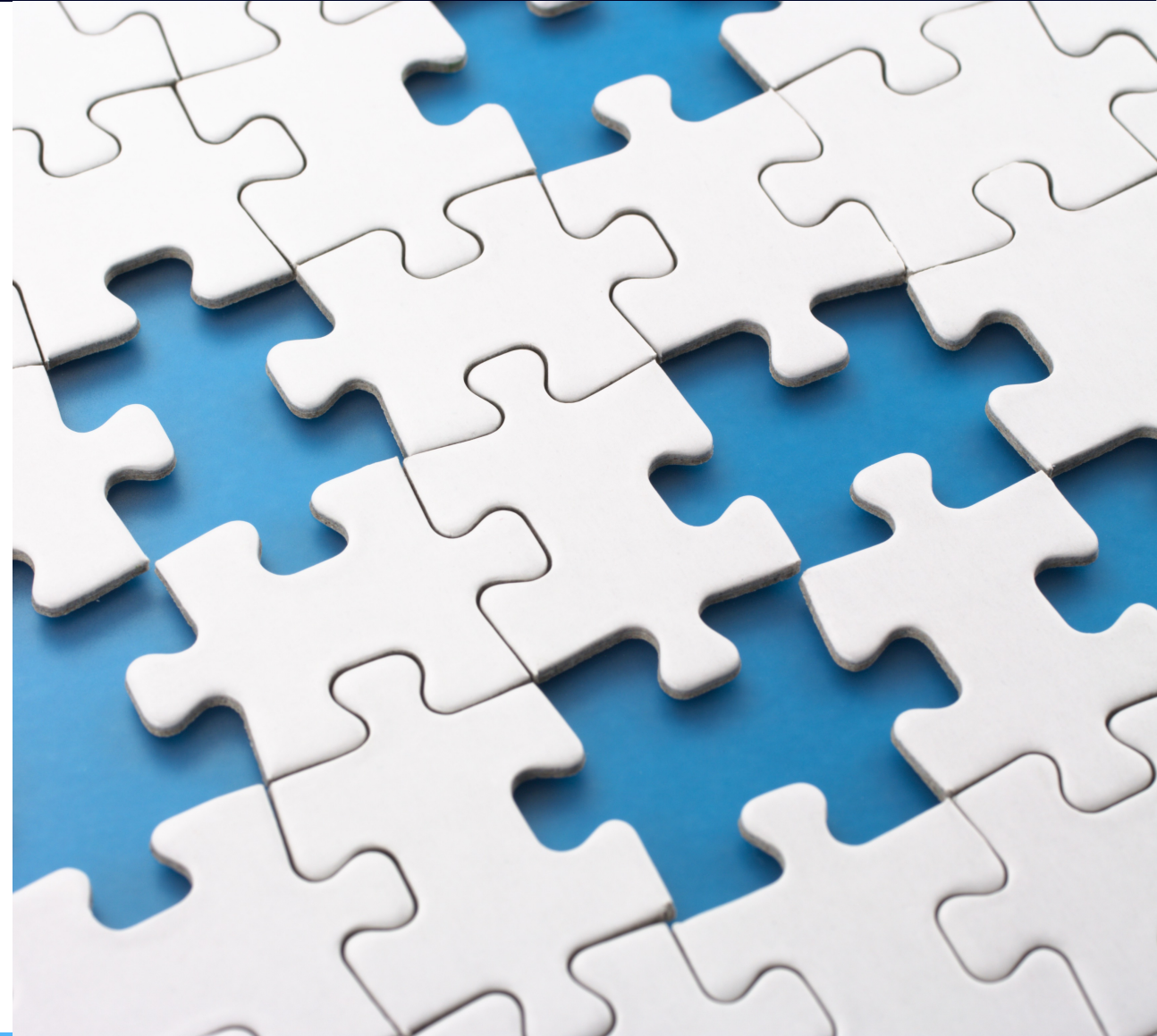
Skills Trends and Gap Analysis

What skills are needed in the workforce?

Does what we teach align with workforce needs?

What skills are we missing in our curriculum?

What new programs should we consider?



Skills Trends

Predicting what skills will be needed in the future is hard, but there is useful information available.

- Use the most current data and research to identify trends.
- Some data to consider include:
 - Job postings data
 - MOOC data
 - Funding sources
 - Publications



Skills Gap Analysis

Skills we teach



Programs

Courses

- Program websites
- Program brochures
- Course descriptions
- Syllabi
- SME Review

Natural Language Processing
(Align to a Skills to a Single Taxonomy)



Skills Gap Analysis

Skills employers need

Job Postings



- Employer websites
- Job boards
- SME Review



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Student Enrollment Probability and Forecasting

How many students will enroll in the next term(s)?

What admissions activities lead to a higher probability of enrollment?

What additional resources should you add to admissions and marketing?

How many faculty will I need to hire?

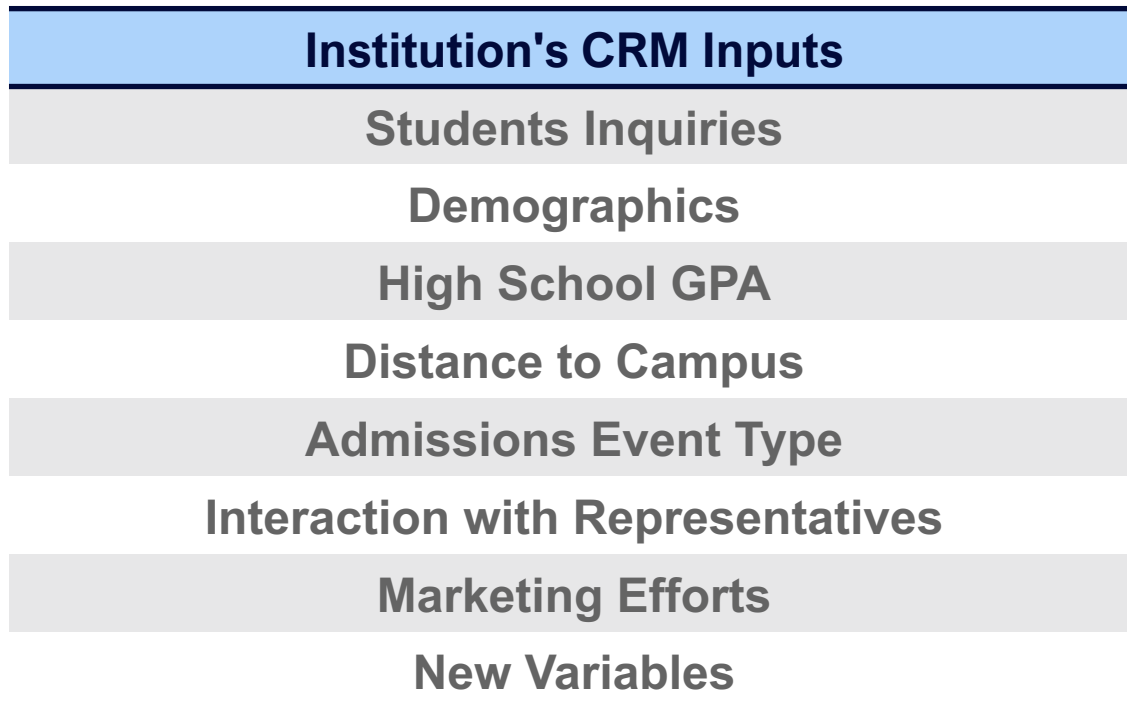


<https://www.jedox.com/en/blog/predictive-forecasting/>



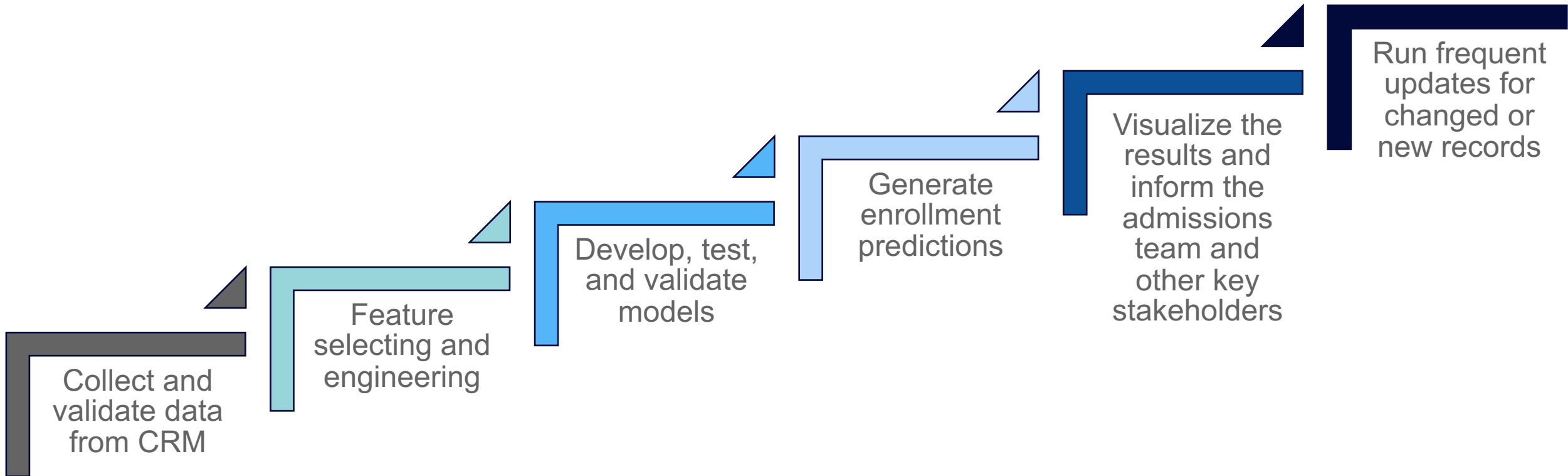
Student Enrollment Probability

Model key factors influencing student decision-making at each stage of the enrollment funnel.





Update Frequently





Student Enrollment Forecasting

The results and analysis will help:

- Inform the admissions team of student prospective-specific activities.
- Evaluate recruitment strategies.
- Budget marketing and admissions.
- Plan faculty and facility resources.
- Estimate tuition revenue.
- Allocate financial aid resources.





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Skills Trends and Gap Analysis

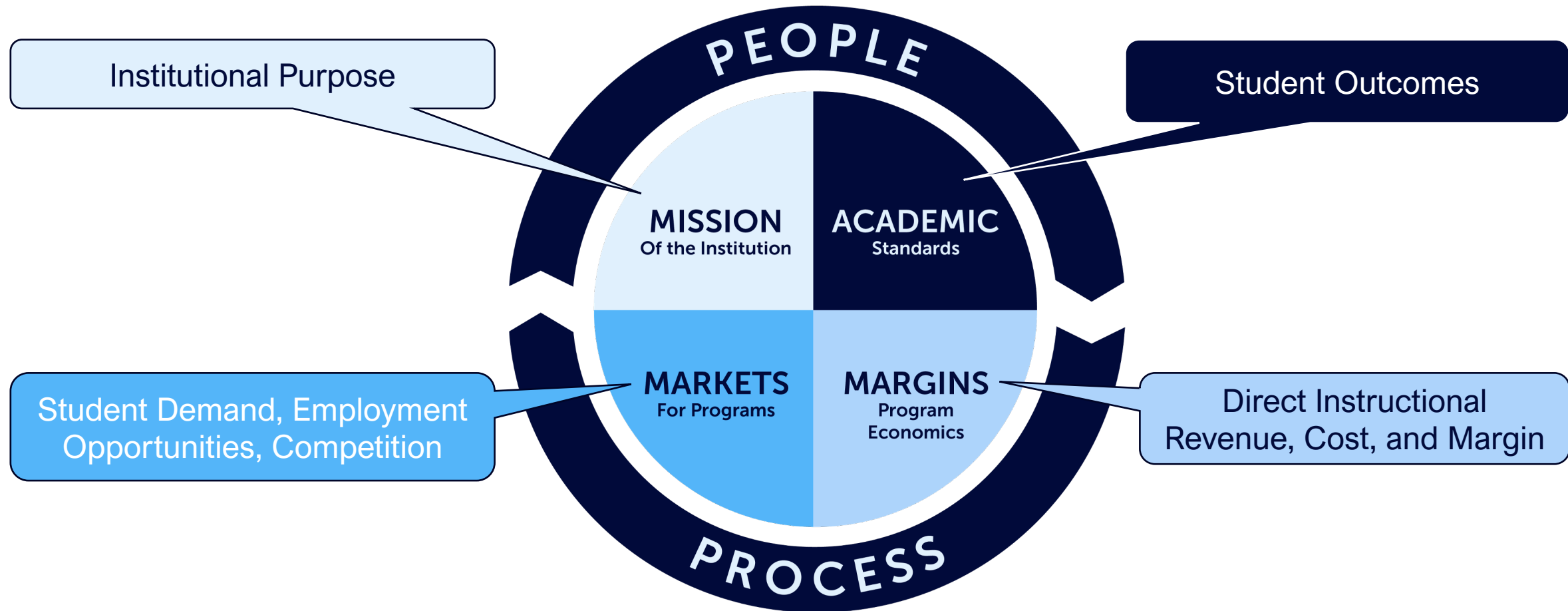
Enrollment Forecasting

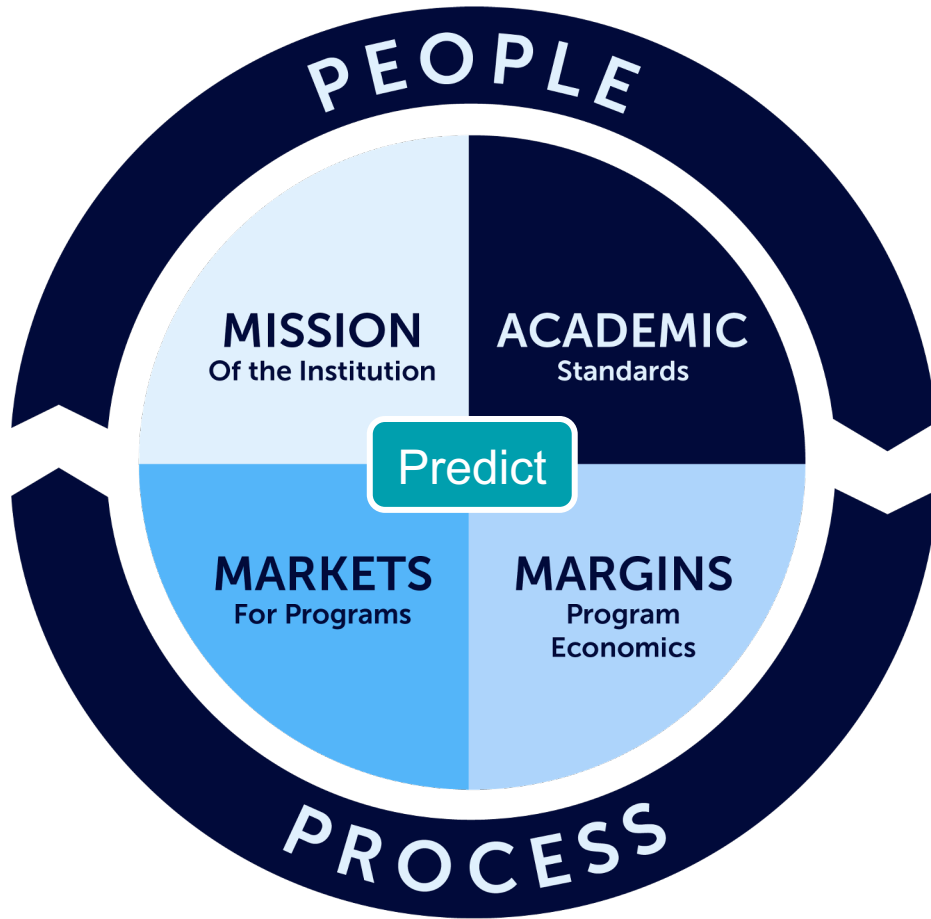
Predict Program Size with Pro Forma Financials

Generative AI



Academic Program Evaluation System





- List of New Programs to Start
- List of Current Programs to Grow
- List of Current Programs to Review



List of New Programs to Start

List of Current Programs to Grow

List of Current Programs to Review



How big will my new programs be?

How much enrollment growth can my current programs achieve?

Are my current programs getting their fair share of the market?

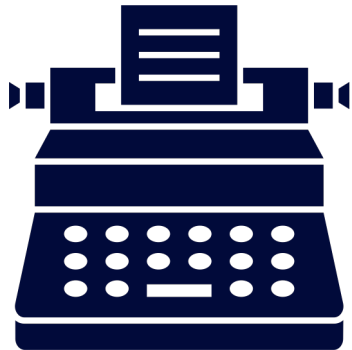


To answer those questions, you need to know the potential size of a program if offered at your institutions.



Past, Present, and Future

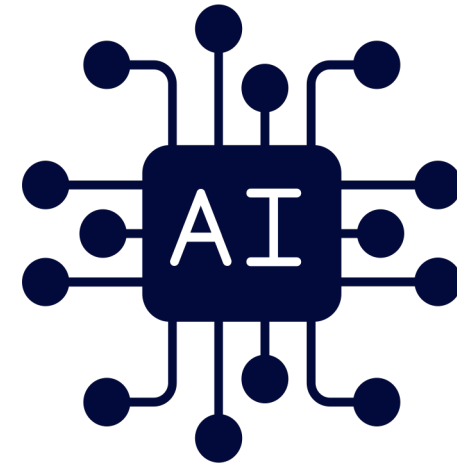
Estimating Program Size



Average Size
Median Size



Peer Institution Analysis
Accreditor's Data



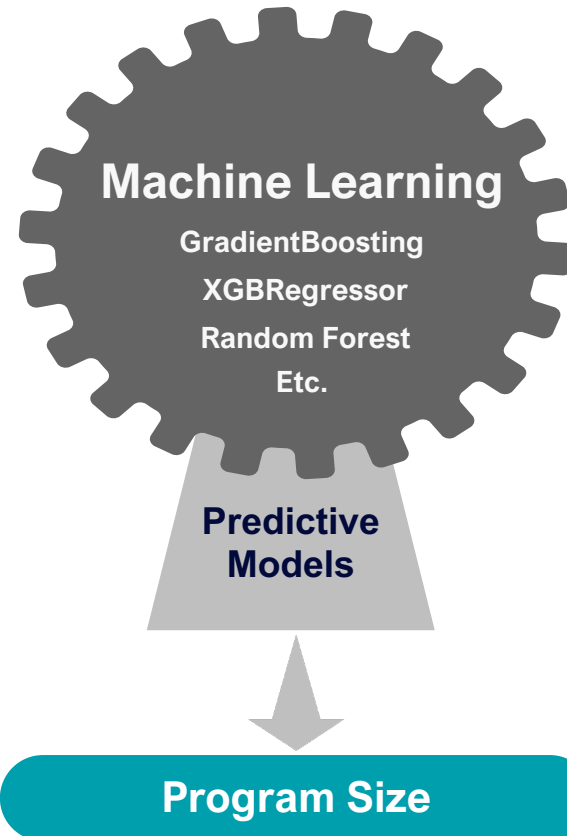
Build Machine Learning



Predict Program Size

School Attributes

- Size
- Sector (e.g., public)
- Focus and portfolio
- Selectivity
- Student types
- Location



Program Attributes

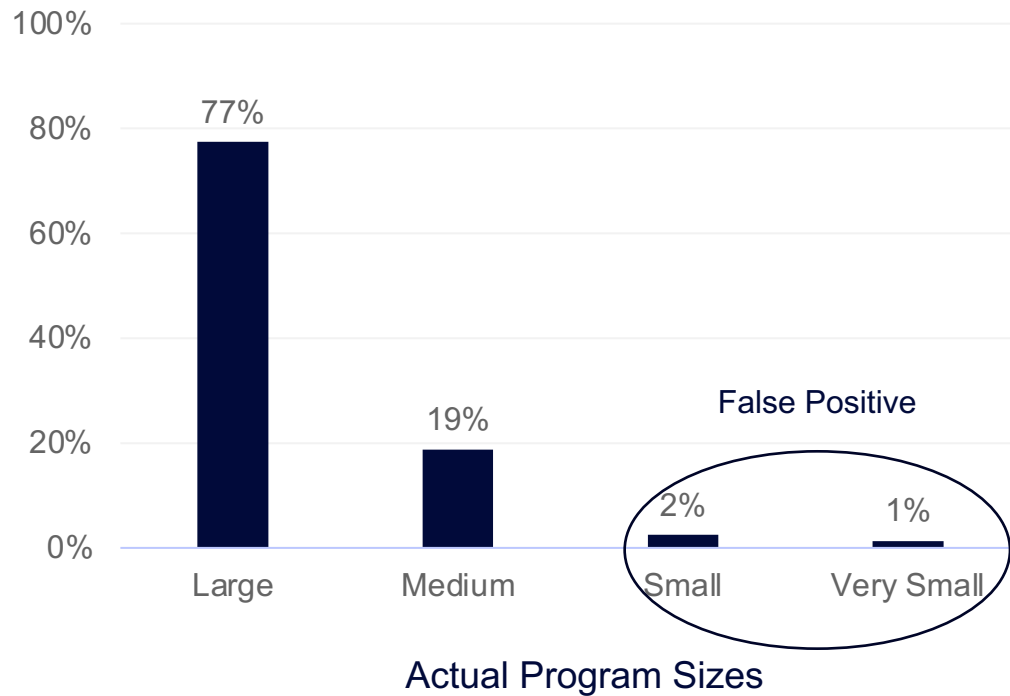
- Size
- Size at similar schools
- Type (e.g., Engineering)
- Award level
- Modality
- Market data
- Program-portfolio fit



Design appropriate validation method.

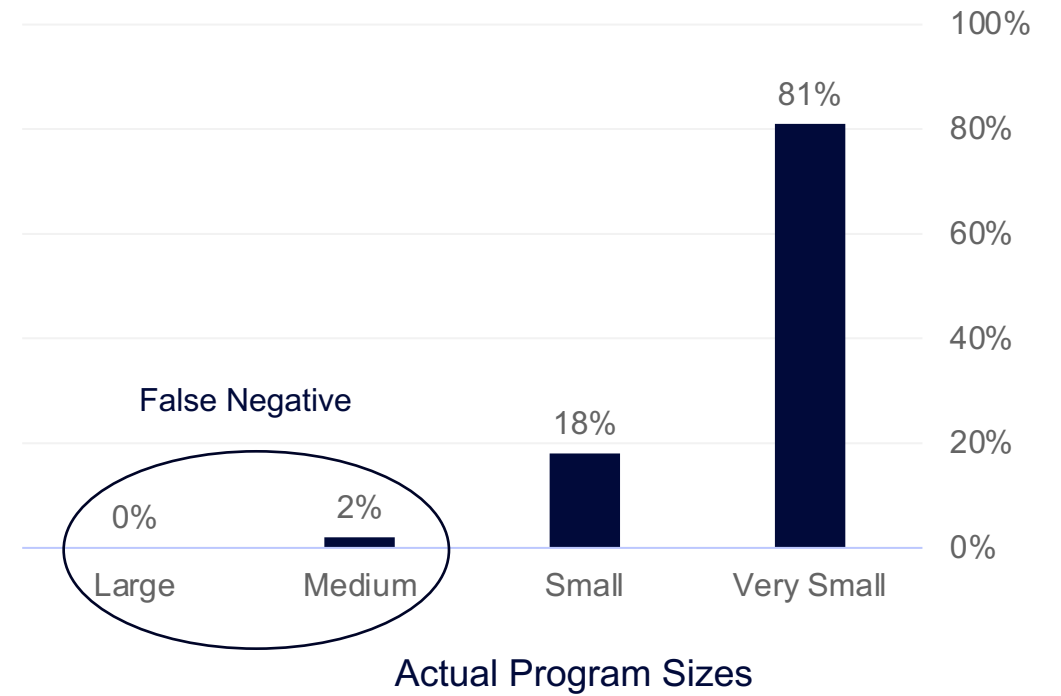
Predicted vs Actual Program Size

Large Program



Predicted vs Actual Program Size

Very Small Program



Pro Forma Financials

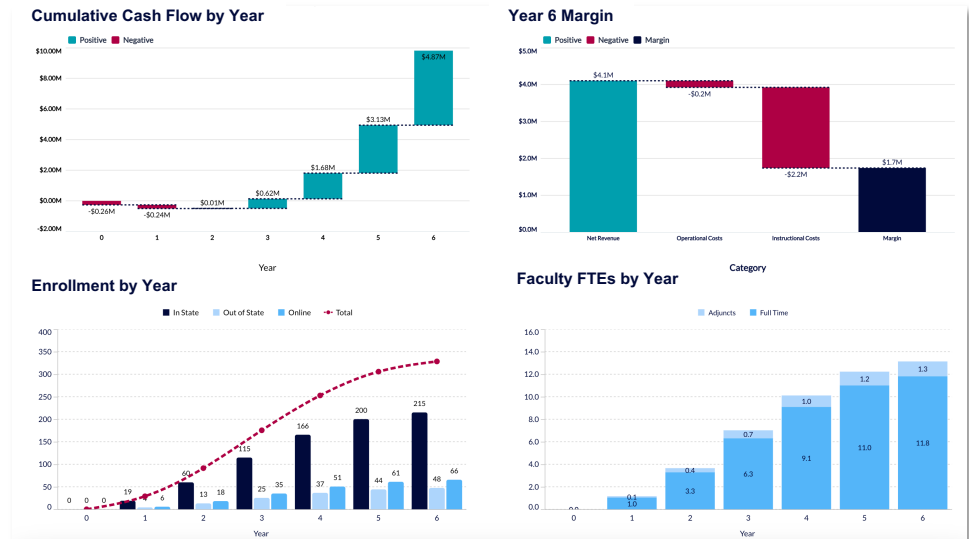
You can know what programs cost before they are added to a program portfolio.



Predicted Size



Benchmark Cost per Student



Pro Forma Financials

Why do you need an automated and robust pro forma financial tool?



Accelerated Insights

In five minutes, you should be able to produce a reliable and ready-to-use pro forma.



Risk Mitigation

Starting a program is always risky. A well-prepared pro forma mitigates the potential risks.



Planning

Pro forma allows you to forecast and budget for your program launch.



Credibility

Machine learning and the integration with benchmarking data boost your pro forma credibility.



Break Even Insights

Know when your program will start generating profit and understand your ROI.

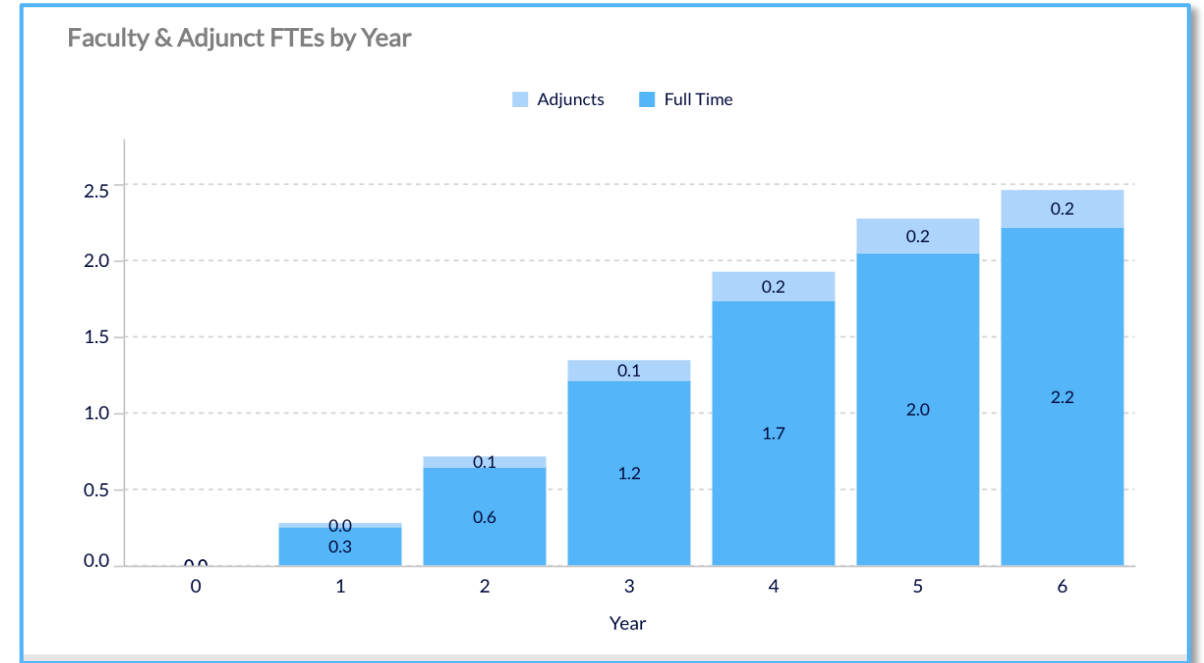
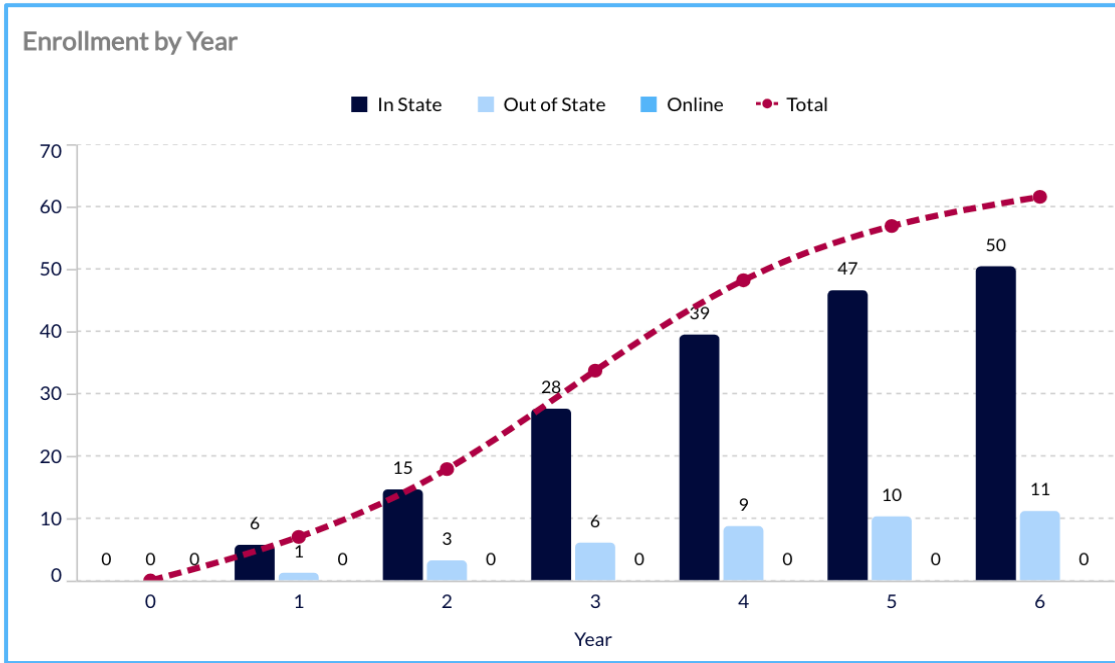


Stakeholder Buy-In

Presenting a well-prepared pro forma enhances the chances of approval.



Enrollment and Faculty FTEs by year



Tuition and Revenue

Include revenue from state appropriation and fees.

Modality ^R	Q	Pre-Launch	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Totals		0	\$291,682	\$948,852	\$1,891,269	\$2,847,168	\$3,624,582	\$4,102,686
In State		-	\$142,506	\$448,943	\$862,024	\$1,242,186	\$1,501,938	\$1,613,383
Out of State		-	\$94,482	\$312,533	\$630,106	\$953,390	\$1,210,389	\$1,365,212
Online		-	\$26,013	\$82,769	\$160,516	\$233,619	\$285,295	\$309,529
Fees		-	\$28,681	\$90,355	\$173,492	\$250,005	\$302,283	\$324,712
State Appropriations		-	\$0	\$14,251	\$65,130	\$167,968	\$324,677	\$489,850

Cost Summary

Integrate with benchmarking data to calculate the instructional cost.

	Q	Pre-Launch	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Total Expenses ^S		262,525	\$267,413	\$701,328	\$1,276,002	\$1,794,266	\$2,172,859	\$2,364,996
Program Instructional Cost		-	\$174,870	\$561,919	\$1,100,530	\$1,617,594	\$1,994,963	\$2,185,851
Marketing Cost		100,000	\$34,887	\$80,601	\$115,488	\$115,488	\$115,488	\$115,488
Cost per SCH		-	\$201	\$205	\$209	\$213	\$218	\$222
Administrative Cost		162,525	\$57,656	\$58,809	\$59,985	\$61,184	\$62,408	\$63,656

Marketing Costs

Calculated Marketing Cost per Start

Historical Marketing Data		
SEO and Website Spend <input type="text" value="5000"/>	SEO and Website Starts <input type="text" value="50"/>	SEO and Website <input type="button" value="Incremental"/> <input checked="" type="button" value="Non-Incremental"/>
SEM Spend <input type="text" value="30000"/>	SEM Starts <input type="text" value="180"/>	SEM <input checked="" type="button" value="Incremental"/> <input type="button" value="Non-Incremental"/>
Social Media Spend <input type="text" value="19000"/>	Social Media Starts <input type="text" value="100"/>	Social Media <input checked="" type="button" value="Incremental"/> <input type="button" value="Non-Incremental"/>
TV/Radio Spend <input type="text" value="5000"/>	TV/Radio Starts <input type="text" value="30"/>	TV/Radio <input checked="" type="button" value="Incremental"/> <input type="button" value="Non-Incremental"/>
OOH (Out of Home) Spend <input type="text" value="5000"/>	OOH (Out of Home) Starts <input type="text" value="20"/>	OOH (Out of Home) <input checked="" type="button" value="Incremental"/> <input type="button" value="Non-Incremental"/>
Other Incremental Spend <input type="text" value="5000"/>	Other Incremental Marketing Starts <input type="text" value="10"/>	
Other Non-Incremental Spend <input type="text" value="5"/>	Other Non-Incremental Starts <input type="text" value="5"/>	

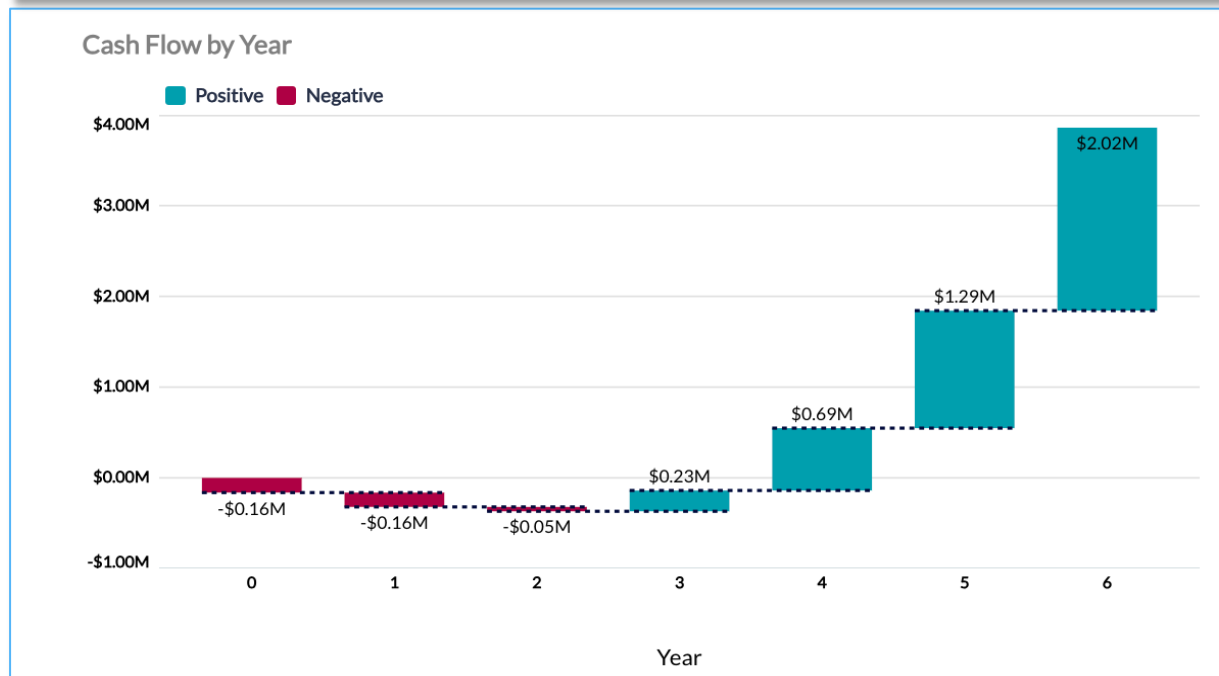
Calculated Marketing Cost per Start		
Historical Incremental Marketing Costs	Historical Incremental Starts	Historical Incremental Cost per Start
\$64,000	340	\$188



Cumulative Cash Flow

Understand when your program will start generating profit.

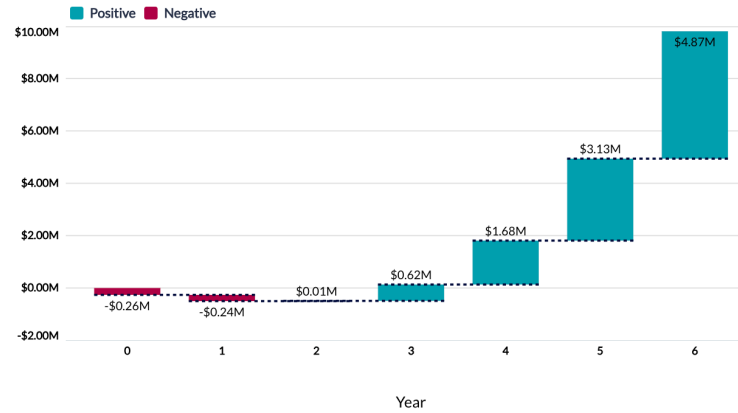
Breakeven Point	Year 6: Total Enrollment	Year 6: Total Revenue
Year 3	62	\$1,115,836



Real Time Analysis

Change your input and see changes in real time.

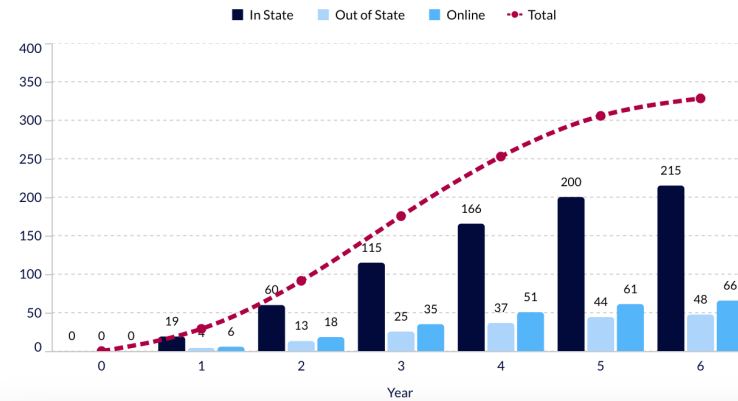
Cumulative Cash Flow by Year



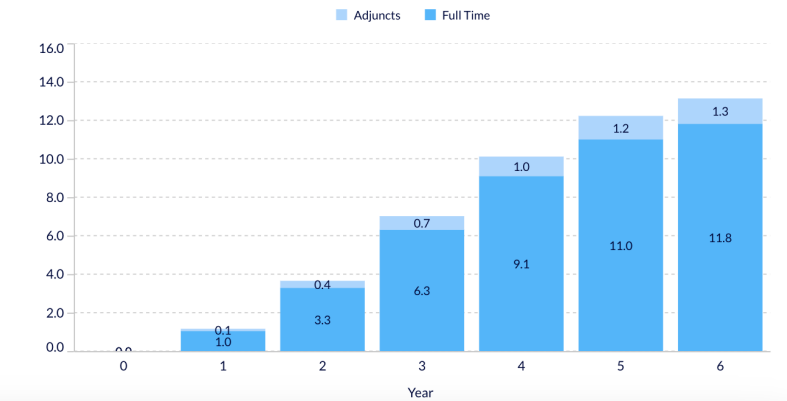
Year 6 Margins



Enrollment by Year



Faculty & Adjunct FTEs by Year



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Generative AI



How can Generative AI help program decisions?

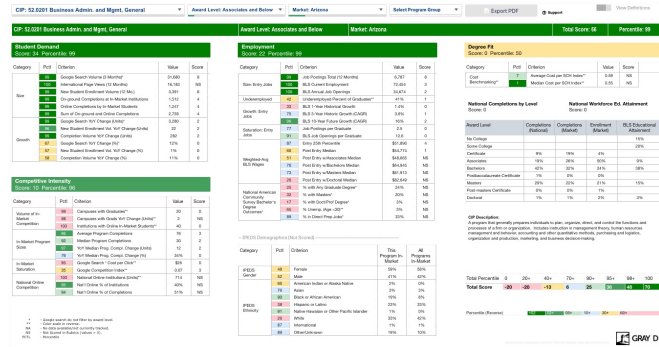
Data Democratization

- Convert data to a written report.
- Gain instant, actionable data insights without needing an analyst.



Numbers Into Text: Should I grow my Sociology program?

You need the right data and methodology to produce an automated report of data-informed insights.



The academic program exhibits a robust Student Demand and promising Employment prospects, yet faces significant Competitive Intensity challenges.

Overview:
 This report delves into the strengths and weaknesses of an academic program, underscored by its high Student Demand, evidenced by a Google Search Volume ranking in the 95th percentile and New Student Enrollment Volume in the 98th percentile. However, it grapples with Competitive Intensity, as seen in the high number of Campuses with Graduates (99th percentile) and National Online Institutions (99th percentile), indicating a saturated market. Employment data presents a mixed picture with high Job Postings (98th percentile) but lower Entry Level Salary rankings (26th percentile), suggesting competitive job prospects with initial lower earnings. The National Completions by Level value at the 98th percentile underscores the program's relevance.

Student Demand:
 The program shines in Student Demand, with Google Search Volume at 72,510 units, placing it in the 95th percentile, and New Student Enrollment Volume at 8,615 units, ranking in the 98th percentile. However, there's a slight concern with the New Student Enrollment Volume YoY Unit Change showing a decrease of 211 units, landing it in the 2nd percentile. Despite this dip, the overall high demand is further supported by On-Ground Completions at In-Market Institutions and Online Completions by In-Market Students ranking in the 98th and 96th percentiles respectively. This indicates strong interest and engagement from prospective students.

Competitive Intensity:
 The program faces stiff competition as indicated by several metrics. Campuses with Graduates stand at 137 units (99th percentile) and Institutions with Online In-Market Students at 5 units (97th percentile), highlighting a crowded field. Conversely, Median Program Completions are favorable at 117 units (89th percentile), but this is overshadowed by the high competition levels reflected in Google Search Cost per Click (\$10.00, 81st percentile) and National Online Institutions (102 units, 99th percentile). This suggests that while there is significant interest and completion rates are healthy, the program must navigate a highly competitive landscape to attract students.

Employment:
 Employment prospects for graduates are generally strong with Job Postings valued at 130,935 units (98th percentile) and BLS Current Employment at 693,635 units (98th percentile), indicating robust job opportunities. However, the Entry Level Salary is somewhat disappointing at \$34,889 (26th percentile), though Post Entry Level Median Salary improves to \$57,037 (52nd percentile). The underemployment rate stands at 51% (61st percentile), presenting a challenge for graduates initially but also suggesting room for growth. These figures point to a competitive yet promising job market for graduates of this program.

- Data
- Prompt Engineering
- Testing
- Accessibility

In Summary

Advanced analytics and artificial intelligence have many applications in Higher Education.

It can help answer questions like:

- How will changes to our value proposition and pricing affect program demand and margin?
- Where should I launch a new campus/site or target marketing and recruiting efforts?
- What skills are needed in the workforce, and do they align with what I teach?
- How many students will enroll in the next term/academic year?
- What admissions activities lead to a higher probability of enrollment?
- How do I budget for a new program, and how much opportunity is there for my current programs?
- How can I use Artificial Intelligence to help analyze and democratize data?

Learn more about the topics covered in our master class series.

Earn Your APEM Certificate

Academic Program Evaluation and Management Course

Understand the data, systems, processes, and people needed to make well-informed and fully supported program decisions



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