

Predictive Analytics:

Leveraging Data to Enhance Enrollment & Student Success

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Overview

- Background
- Art/Science
- Application
- Lessons Learned
- Questions



Background: Foundation Principles

- Enterprise Data Warehouse (EDW)
- Long-Term & Work Intensive Project
- Numerous Starts/Stops
- Predictive vs. Actionable
- Cross-Functional Team

Background: Cross Functional Team

- Institutional Effectiveness/Research (x3)
- Information Services (x3)
- Counseling/Advising (x2)
- Admissions & Recruitment (x2)
- Student Orientation & Retention (x1)
- Student Life (x1)
- Academic Support (x1)
- Outside Vendor (ZogoTech)

Background: Models

- Departure
 - Model 1: End of Term
 - Model 2: Beginning of Term
- Success
 - Model 3: Toxic Course Combinations
- Early Alert
 - Model 4: Academic Probation
 - Model 5: Academic Support (Math)

Art vs. Science



- Decision tree, entropy algorithm
- No weighting of features
- 2,000+ features to evaluate
- Sample size & probability of departure

- Sample purity & information gain
- Tests splits using features
- Creates contrast
- Tells story

Art/Science: Decisions Trees Considerations

Advantages	Challenges
Robust Classifier	Descriptive Statistics
Feature Interactions	Actionable Features
Rich Visualizations	Less Traditional
Database Integration	Larger Trees
Holistic & Prescriptive	Semester Target

Art/Science: Timing – End of Term vs. Beginning of Term

End of Term	Beginning of Term
First-Time Students - Grades	First-Time Students – No Grades
Lagging Indicators	Leading Indicators
After Grades Post	Registration To Census
Intervention Is Reactive	Intervention Is Proactive

- EDW houses decision tree data
- Track journey of students through tree
- Join any decision tree feature to other EDW records
- Drives analysis & automation

Art/Science: Ingredients For Success

- Design principles & visualizations
- Investment in engineering
- Collection & study of data
- Interdisciplinary collaboration

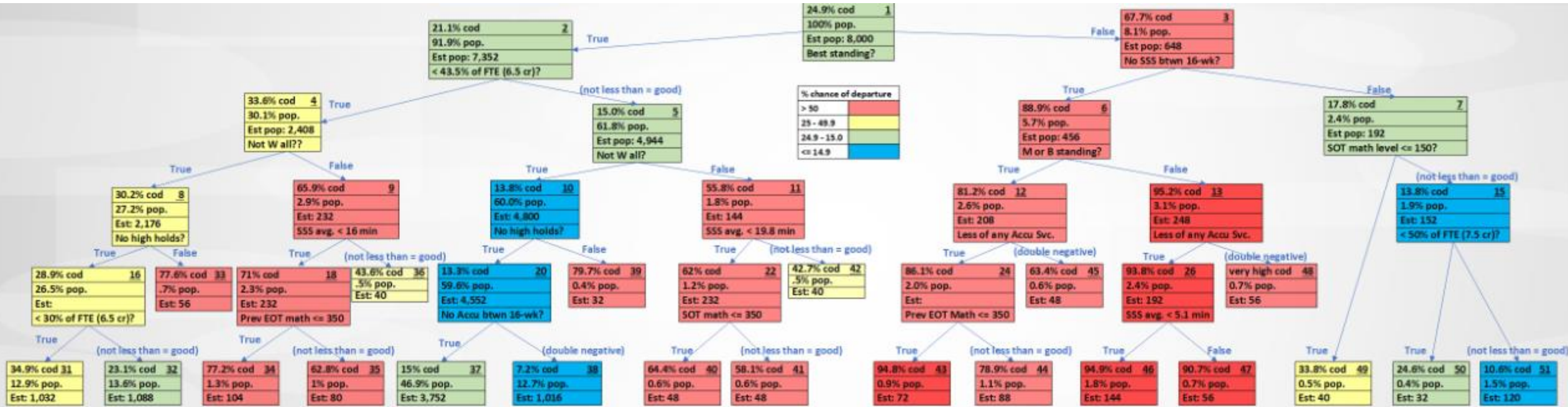
Model I: Departure – End of Term



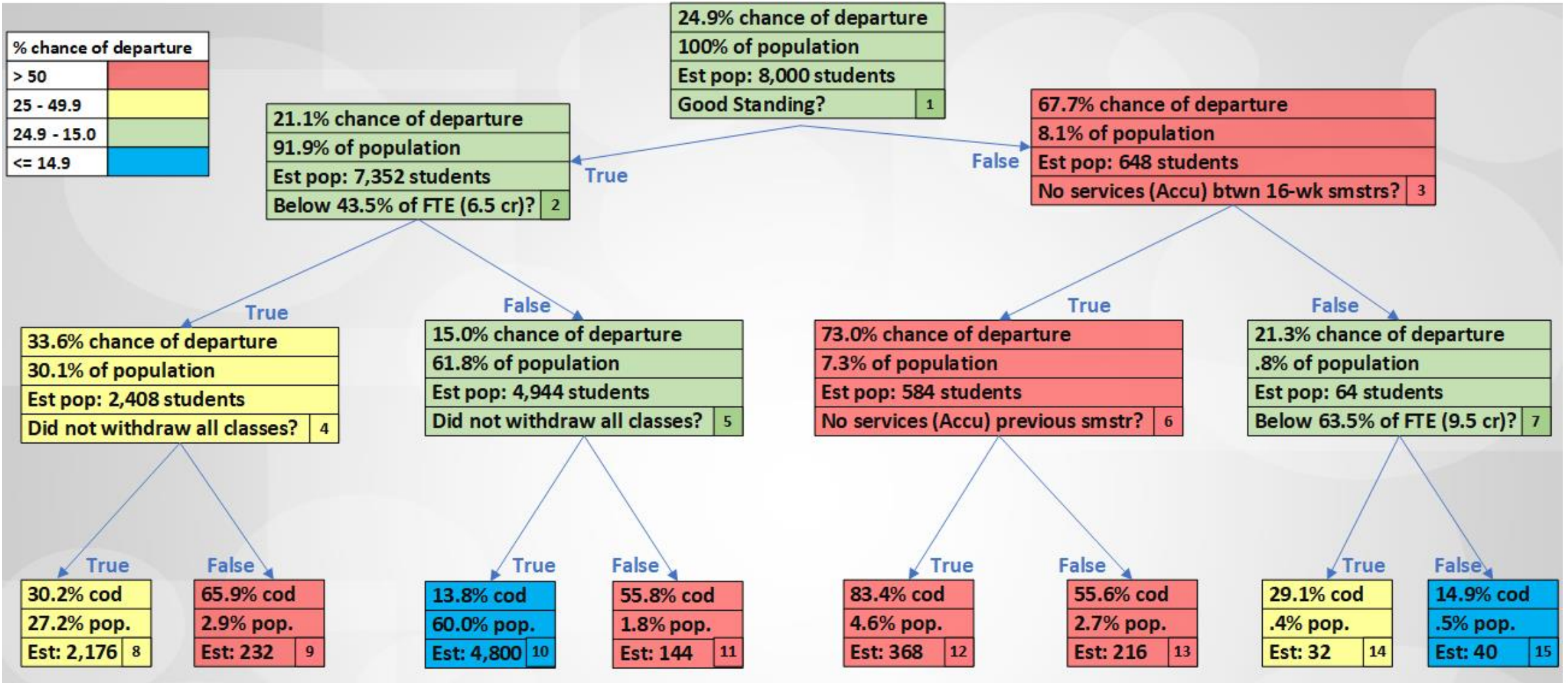
Departure: Model I – End of Term

- End of Term Model
 - Predicts probability of departure for next term
- All Degree-Seeking, Continuing Students
- Launched Spring 2020
 - Effects of COVID-19

Departure: Model I – End of Term



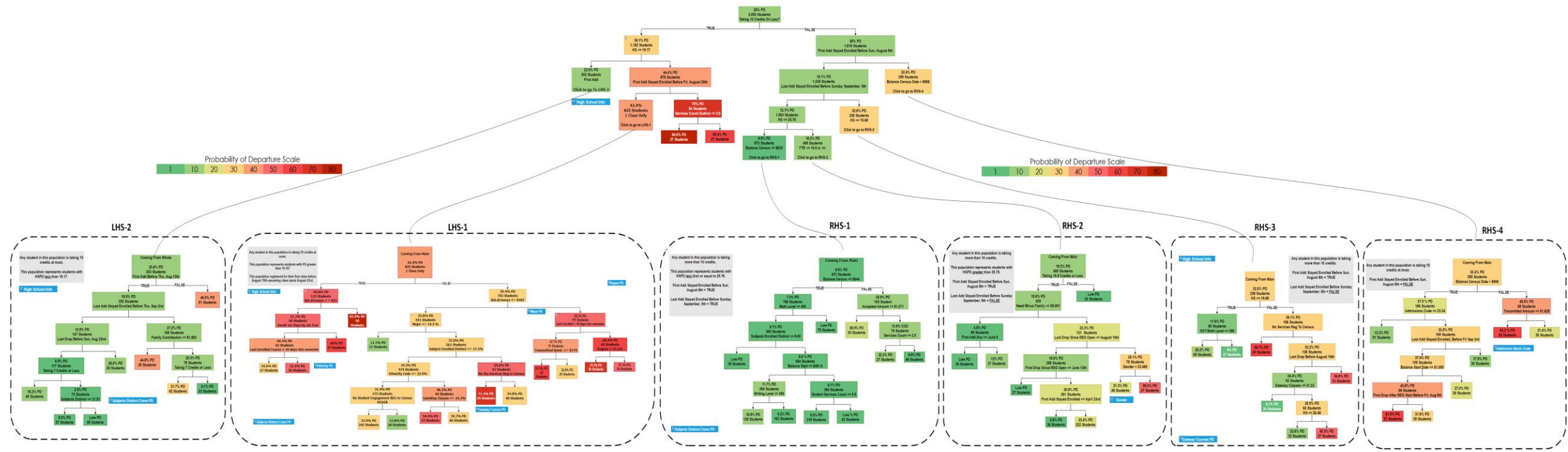
Departure: Model I – End of Term



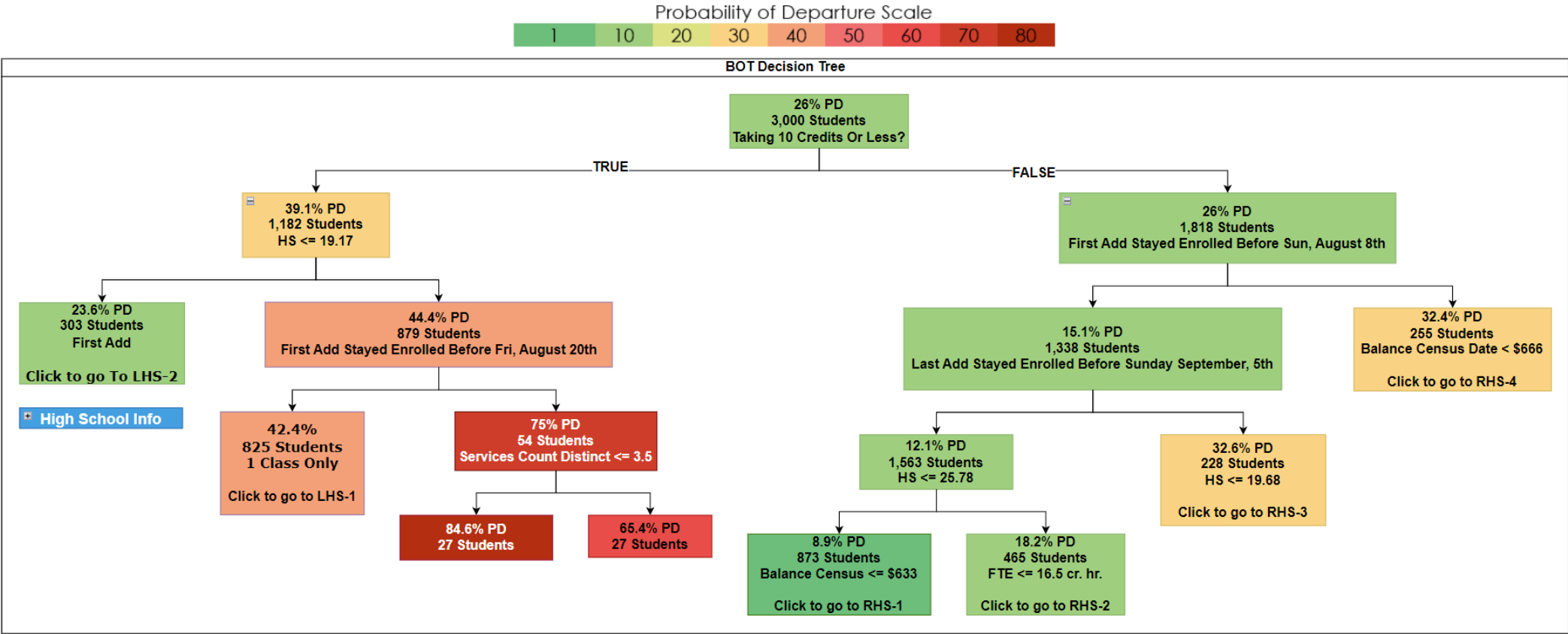
Model II: Departure – Beginning of Term



Departure: Model II – Beginning of Term

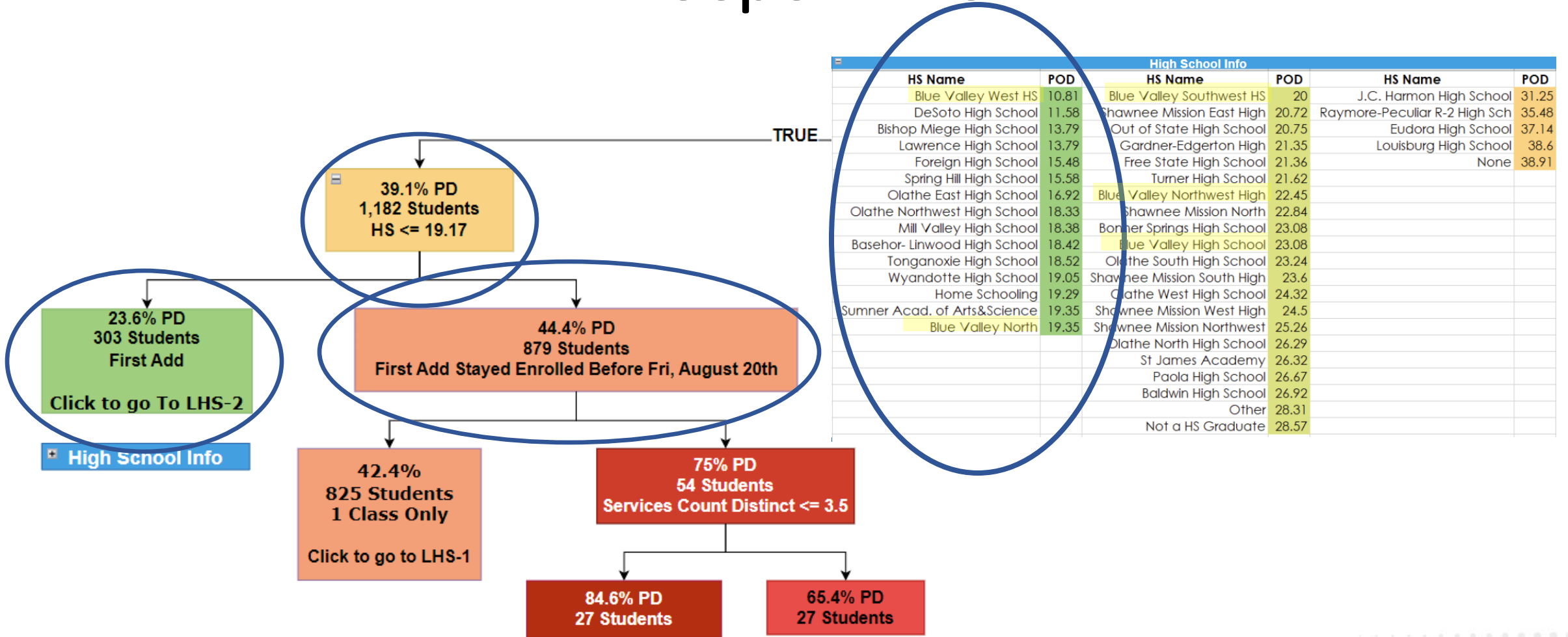


Departure: Model II – Beginning of Term



Departure: Model II – Beginning of Term

Deeper Dive



Related to Recruitment Territories

Completed

- Adjusted Number of High School Visits
- Customized Communication to Students
- Informed High School Counselors and Principals
- Enhanced Push to Visit Support Services

Future Projects

- Compare Enrollment Data Against NSC
- Use Campus Variable Data Printer to Automate Personalized Communication
- Mandatory Advising
- Mandatory Wrap-around Services

Departure: Model II – Beginning of Term

Related to Recruitment Territories

Rhiannon				David				Bo	
School	2023 Grads with Early College Credit	2023 Grad Enrollment Rate	Prob of Depart from JCCC w/out degree or cert	School	2023 Grads with Early College Credit	2023 Grad Enrollment Rate	Prob of Depart from JCCC w/out degree or cert	School	Prob of Depart from JCCC w/out degree or cert
Bishop Miege	50.66%	8.55%	13.79	Baldwin	28.13%	14.58%	26.92	Bishop Ward	
Blue Valley Academy				De Soto	61.34%	14.71%	11.58	Bonner Springs	23.08
Blue Valley High School	60.00%	10.81%	23.08	Eudora	52.34%	13.08%	37.14	FL Schlagle	
Blue Valley North	48.86%	16.86%	19.35	Gardner-Edgerton	36.36%	19.86%	21.35	Highland Park	
Blue Valley Northwest	55.98%	11.14%	22.45	Lansing				JC Harmon	31.25
Blue Valley Southwest	53.33%	12.22%	20	Leavenworth				Kansas City, MO & Metro Area	
Blue Valley West	54.13%	8.55%	10.81	Louisburg			38.6	Lawrence Free State	21.36

Model III: Toxic Course Combinations



Success: Model III – Toxic Course Combinations

- Toxic Course Combinations
 - Success/failure of course pairings
- 65% of student schedules are unique (sample size)
- Success Rates: pairs, individual courses

Who Can Use This Information?

- Students
- Counselors/Advisors
- Learning Resource Centers
- Departments/Programs

Planning Ahead

- Awareness
 - Information is Power
 - Time Commitment
 - Campus Resources

- Course Planning
 - DOES NOT MEAN AVOID
 - Course Options
 - Future Course Planning

Communication

- Multiple, Proactive, Resource Driven Outreach
 - Counseling/Advising Sessions
 - Learning Resource Center Information
 - Stress Management
 - Time Management
 - Important Deadlines (drop dates etc.)

Academic Program Review

- Making the Connection
- Course Sequencing
- Course Evaluation

Model IV: Early Alert – Academic Probation



Early Alert: Model IV – Academic Probation

- Strategic Plan – Wrap Around Services

- Student on Academic Probation
 - Identify after
 - Identify before?

- Early findings
 - GPA
 - Subjects enrolled
 - High school/zip code
 - Enrolled date
 - Minimal value to predict after 1st term in college

Model V: Early Alert – Academic Support (Math)



Early Alert: Model V – Academic Support (Math)

- Academic support absent → why?
- Attendance pattern challenge → how to measure?
- Math courses vary → population size
- Outcome target → course success vs. departure

Lessons Learned



Lessons Learned

- Population selection
- Time & iterations
- Cross-Functional
- Policy implications
- Track communication
- Know what/how to measure
- Change management/control

QUESTIONS?



Predictive Analytics:

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