


Predictive Models Based on Behavioral Patterns in .edu

What We've Been Learning From the
PAR Framework

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June 1, 2015

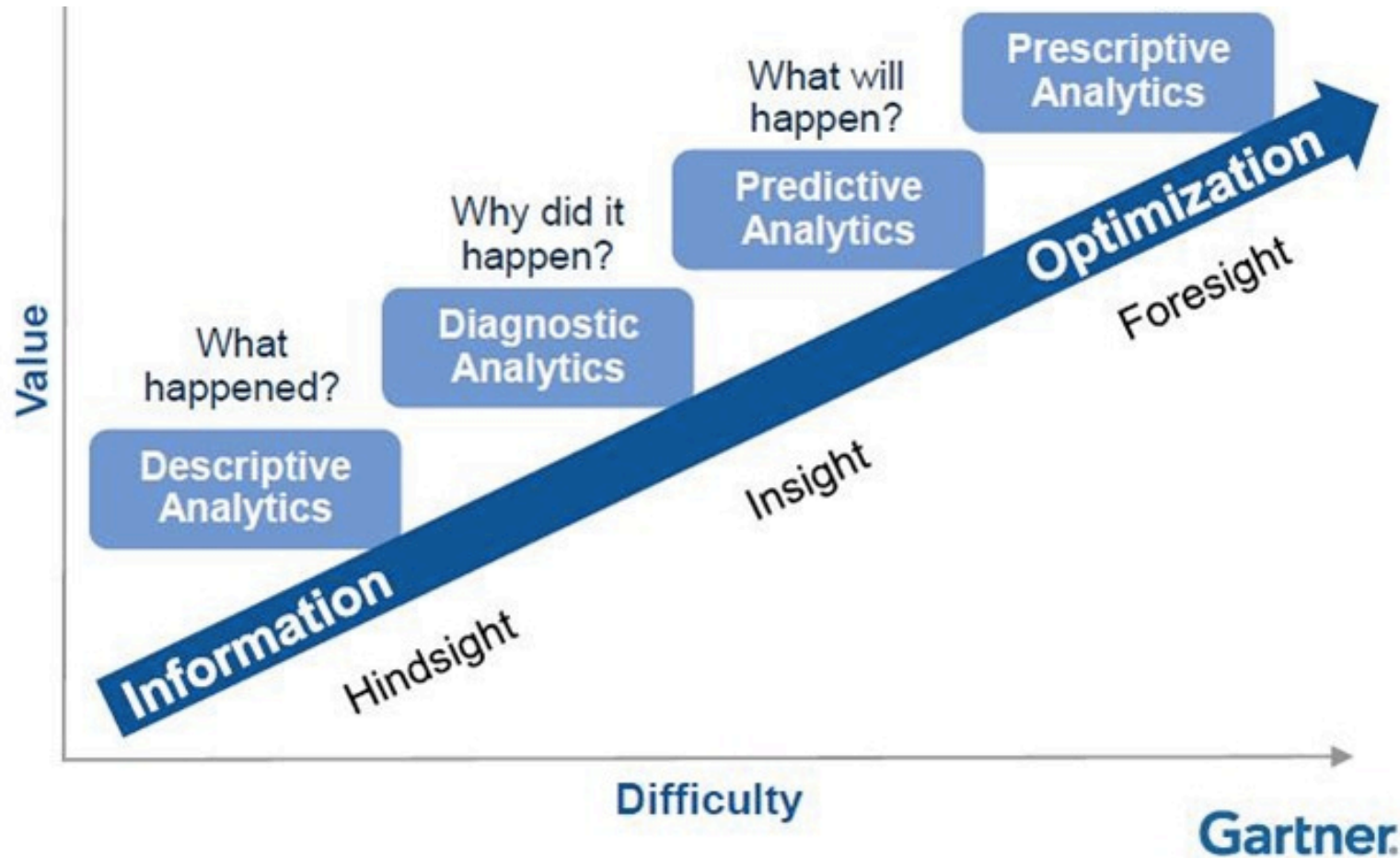


*Ten Years from Now,
When We Look Back at
How This Era of Big Data Evolved...*

*We Will Be Stunned at How
Uninformed We Used to Be
When We Made Decisions*

– Billy Bosworth, DataStax CEO (2015)

From Hindsight to Foresight



While “Big Data” raise expectations, student data drive big decisions in .edu



Are You “Scorecard-Ready”?



U.S. Department of Education

College Affordability and Transparency Center[?]



Welcome to the College Affordability and Transparency Center
Start here to find information about how much it costs students
to attend different colleges, how fast those costs are going up,
and information related to why costs are going up.

College Scorecard

College Scorecards make it easier for you to search for a college that is a good fit for you. You can use the College Scorecard to find out more about a college's affordability and value so you can make more informed decisions about which college to attend.

[Enter](#)

Net Price Calculator Center

Here you will find links to colleges' net price calculators. Net price calculators help you estimate how much colleges cost after scholarships and grants.

[Enter](#)

College Navigator

Here you can search for and compare colleges on all sorts of criteria including costs, majors offered, size of school, campus safety, and graduation rates.

[Enter](#)

College Affordability and Transparency List

Here you will find information about tuition and net prices at postsecondary institutions. The site highlights institutions with high and low tuition and fees as well as high and low net prices (the price of attendance minus grant and scholarship aid). It also shows institutions where tuition and fees and net prices are increasing at the highest rates.

[Enter](#)

90/10 Information

Here you will find a list of for-profit (proprietary) postsecondary institutions that receive more than 90 percent of their revenues from Title IV Federal Student Aid.

[Enter](#)

State Spending Charts

Here you will find summary information on changes in state appropriations for postsecondary education, state aid for students, and tuition and fees.

[Enter](#)

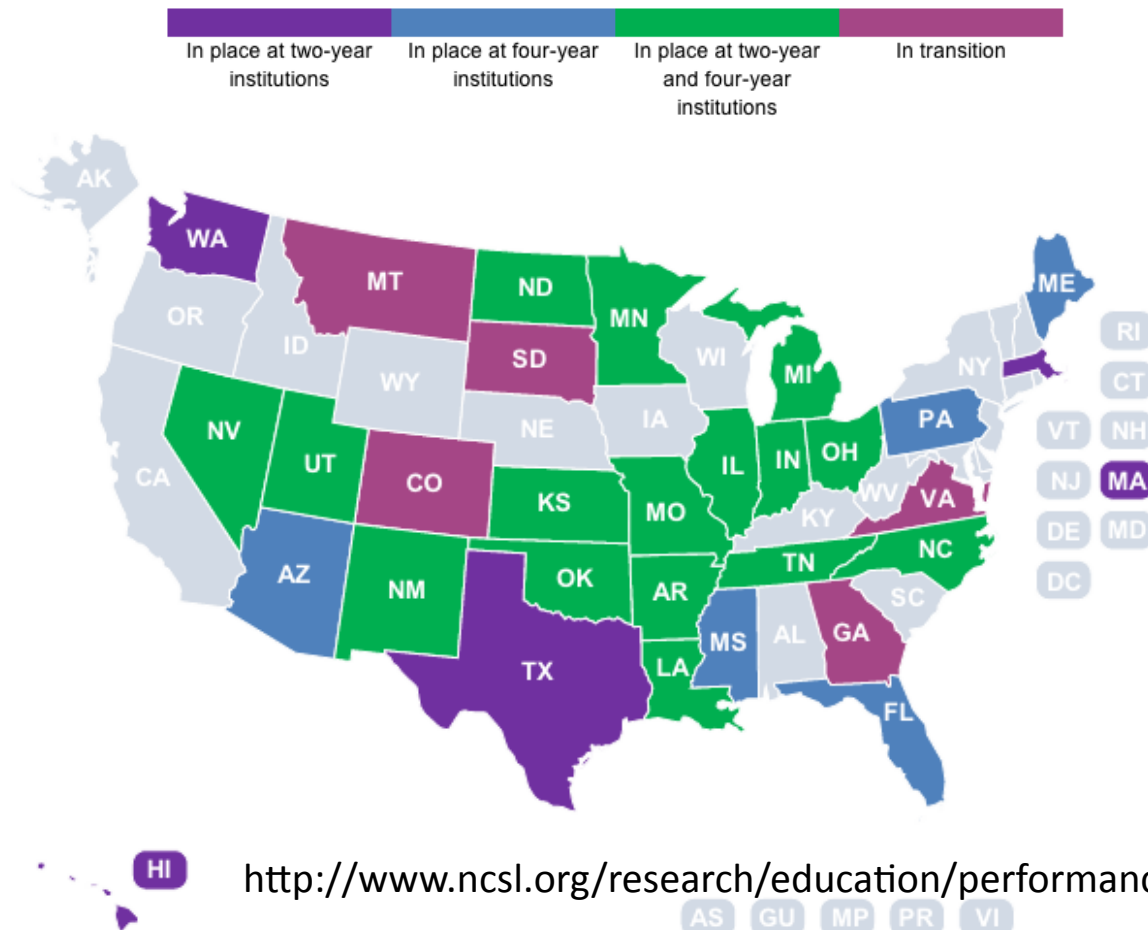
<http://collegecost.ed.gov/>



parframework.org

PAR
FRAMEWORK

Performance Based Funding and US Post-Secondary Institutions



The US college completion problem

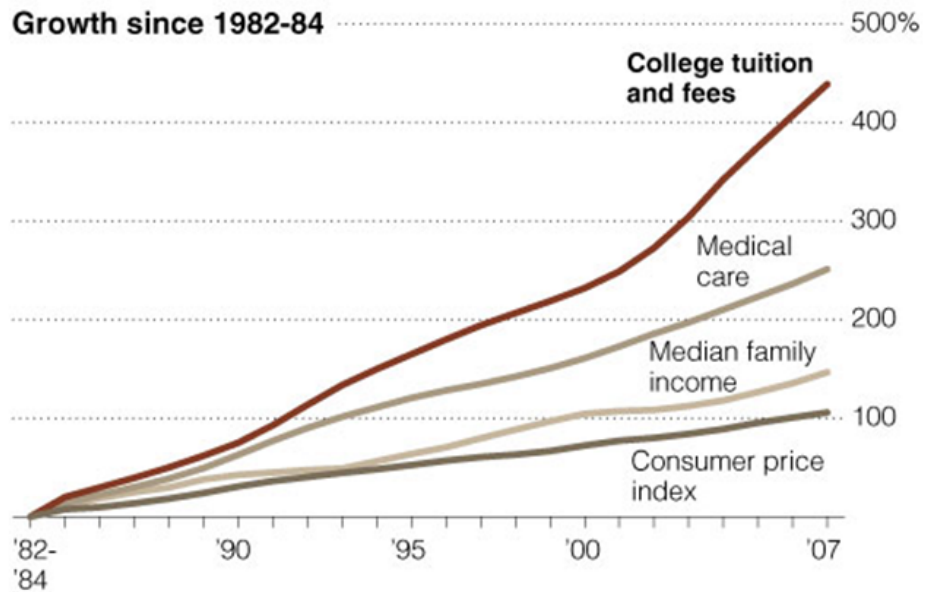
The New York Times

December 3, 2008

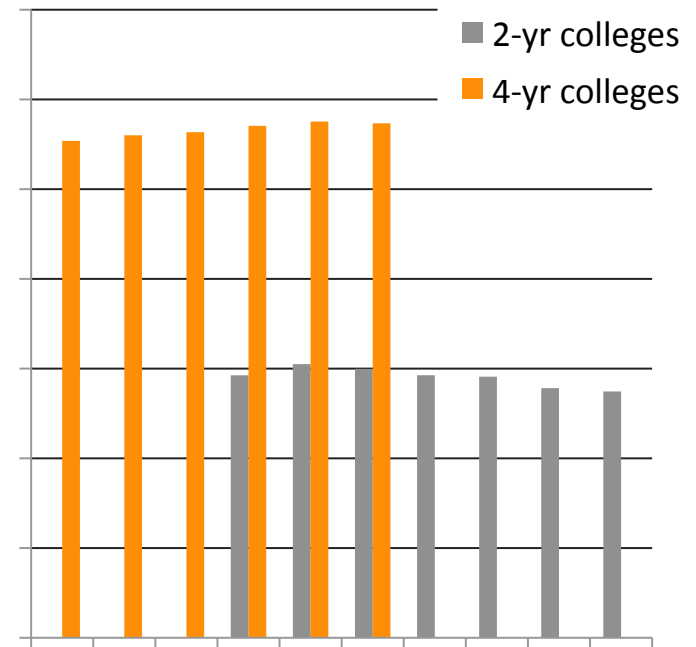
Soaring College Tuitions

College tuition continues to outpace median family income and the cost of medical care, food and housing.

Growth since 1982-84



Graduation rates at 150% of time



So – How are we doing?

- The president's ambitious goal of being 1st in the world by 2020 looks unachievable.
- While the national college-graduation rate has climbed to 44 percent, the gulf between the United States and other nations remains wide, and the target is moving.
- How are we doing? We have moved up from 12th place into a tie for 11th place
- Meanwhile, US Ed Tech companies hit paydirt in 2014, raising 1.36 Billion in 201 rounds of funding with more than 386 unique investors.

<http://chronicle.com/article/6-Years-in6-to-Go-Only/151303/>

<https://www.edsurge.com/n/2014-12-23-2014-us-edtech-funding-hits-1-36b>

INNOVATION:

A TECHNOLOGY TRIGGER?

OR

**NOVEL SOLUTION TO
WICKED PROBLEMS?**



A 501 (c) (3) Organization

Driving
**student
success**
via Analytics, Interventions,
Measurement, and Benchmarks

PAR Framework

- Collaborative, member-driven, non-profit analytics as a service provider.
- Comprehensive approach to student success
 - Cross institutional benchmarks
 - Institutional specific predictive models
 - Individual student-level watch lists for retention & academic success
 - Actionable framework for understanding campus intervention programs and measuring efficacy

A massive, commonly defined dataset for analytics

- More than 2,500 downloads of PAR data definitions
- > 2.4 million students and >25 million student courses in the PAR data warehouse, in a single federated data set, developed using common data definitions.
- 351 unique campuses
- 77 discrete variables are available for each student record in the data set. Additional 2 dozen constructed variables used to explore specific dimensions and promising patterns of risk and retention.

PAR Differentiators

- PAR open frameworks
- Massive dataset for analytics
- Community of practice and research, with a focus on research outcomes
- Market validated and member driven institutional intelligence tools

Game Changer: Common Data Definitions



[Photo by: Hans Hillewaert](#)



parframework.org

PAR
FRAMEWORK

Common Data Elements

Difficult to define data variables

- What is a passing grade?
- What is a term?
- What is retention?

Student Demographics & Descriptive	Student Course Information	Course Catalog	Lookup Tables	Student Financial Information	Student Academic Progress
<ul style="list-style-type: none"> • Gender • Race • Prior Credits • Perm Res Zip Code • HS Information • Transfer GPA • Student Type 	<ul style="list-style-type: none"> • Course Location • Subject • Course Number • Section • Start/End Dates • Initial/Final Grade • Delivery Mode • Instructor Status • Course Credit 	<ul style="list-style-type: none"> • Subject • Course Number • Subject Long • Course Title • Course Description • Credit Range 	<ul style="list-style-type: none"> • Credential Types Offered • Course Enrollment Periods • Student Types • Instructor Status • Delivery Modes • Grade Codes • Institution Characteristics 	<ul style="list-style-type: none"> • FAFSA on File – Date • Pell Received/ Awarded – Date 	<ul style="list-style-type: none"> • Current Major/CIP • Earned Credential/ CIP

New Features Planned for 2015-16

- Placement Tests
- Admission/Application Data
- College Readiness Surveys
- LMS Data
- Satisfaction Surveys
- Intervention Measures

Common Framework for Examining Interventions

PREDICTOR CATEGORY <i>italics</i> = research literature regular = partner experience bold =PAR Framework findings —limited list of predictors below each category—	CONNECTION application to enrollment (advising to enrollment)	ENTRY completion of gatekeeper courses (beginning of class)	PROGRESS entry into program to 75% of classes complete (middle of class)	COMPLETION of course of study & credential w/ market value (end of class)
LEARNER CHARACTERISTICS <i>prior GPA; achievement beliefs; content Knowledge & skills; ... 1st time in college</i>				
LEARNER BEHAVIORS <i>attendance/log ins; participation in orientation programs; withdrawals;...engagement</i>				
ACADEMIC INTEGRATION <i>participation in student learning communities; peer mentoring;...specialized program coordinators</i>				
SOCIAL/PSYCHOLOGICAL INTEGRATION <i>perceived social presence; participation in freshmen interest groups;...specialized program coordinators</i>				
OTHER LEARNER SUPPORT <i>ongoing student support services...</i>				
COURSE/PROGRAM CHARACTERISTICS <i>perceived interactivity; ...perceived utility</i>				
INSTRUCTOR BEHAVIORS/CHARACTERISTICS <i>faculty responsiveness;...perceived social presence</i>				

PAR Puts it All Together

- Determine students probability of failure (*predictions*)
- Determine which students respond to interventions (*uplift modeling*)
- Determine which interventions are most effective (*explanatory modeling*)
- Allocate resources accordingly (*cost benefit analysis*)

PAR Framework Benefits to Members

- **STUDENT SUCCESS PROGRAMS THAT WORK**

Take the guesswork out of finding which students are at risk and why, and learn how to successfully respond.

- **INTERVENTION PORTFOLIO MANAGEMENT**

Identify gaps and overlaps in intervention strategies for specific student segments, for an entire campus, comparison to peers.

- **INSTITUTIONAL ROI**

Evaluate the cost and benefit of myriad student success programs to eliminate redundancy and operate sustainably.

- **BEST-IN-CLASS COLLABORATION**

Work with peer institutions to collaborate on what programs work best, enabling rapid scale of interventions that work.

Gartner Research on the PAR Framework, July 2014

... In this complex endeavor we recommend a “learning by doing” approach and joining or at least studying the PAR Framework project experience. This is the most advanced openly available information in higher education to our knowledge.”

Jan-Martin Lowendahl, (2014) Education Hype Cycle. Stamford
CT: Gartner Research July 23, 2014 G00263196



Reflections on 4 Years in the Learner Analytics Trenches

- In .edu, big data *may* be in our future, but we also need to leverage little and medium data to help drive better decision-making.
- Common data definitions are a game changer for scalable, generalizable, repeatable learner analytics.
- Predictions are of greater institutional value when tied to treatments and interventions for improvement, and intervention measurement to make sure results are being delivered.

Reflections on 4 Years in the Learner Analytics Trenches

- Infrastructure matters, but EXOSTRUCTURE matters more.
- Scale requires reliable, generalizable outcomes and measures that can be replicated in a variety of settings with a minimal amount of customization. In the case of PAR, common definitions and look-up tables served as a “Rosetta Stone” of student success data, making it possible for project to talk to one another between and within projects.
- Using commercial software stacks already in place on campuses and data exchanges to extend interoperability with other IPAS systems extends value and utility of tech investments.

Reflections on 4 Years in the Learner Analytics Trenches

- Change happens when fueled by collaboration, transparency and trust.
- Data needs to matter to everyone on campus. While data professionals will be needed to help construct new modeling techniques, ALL members of the higher education community are going to need to “up their game” when it come to being fluent with data-driven decision-making, from advisors to faculty to administrative staff to students.
- It takes all of us working together toward the same goal in our own unique ways to make the difference.

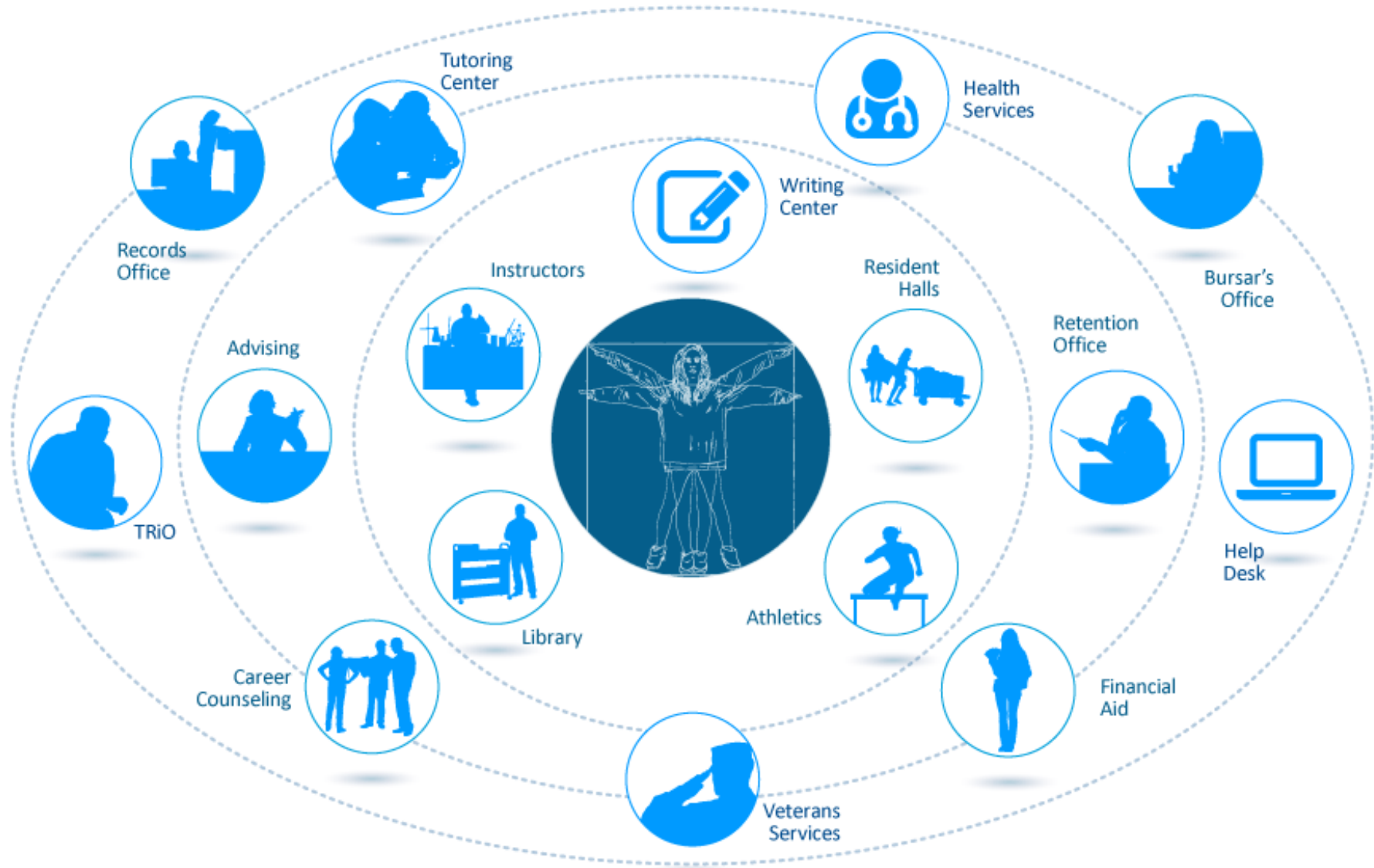


Scaling what's working at each college

David Yaskin

Sr. VP, Student Success, Hobsons;
Founder, Starfish Retention Solutions

Student Services: 5-12% of Institutional Budget



Vendor Landscape

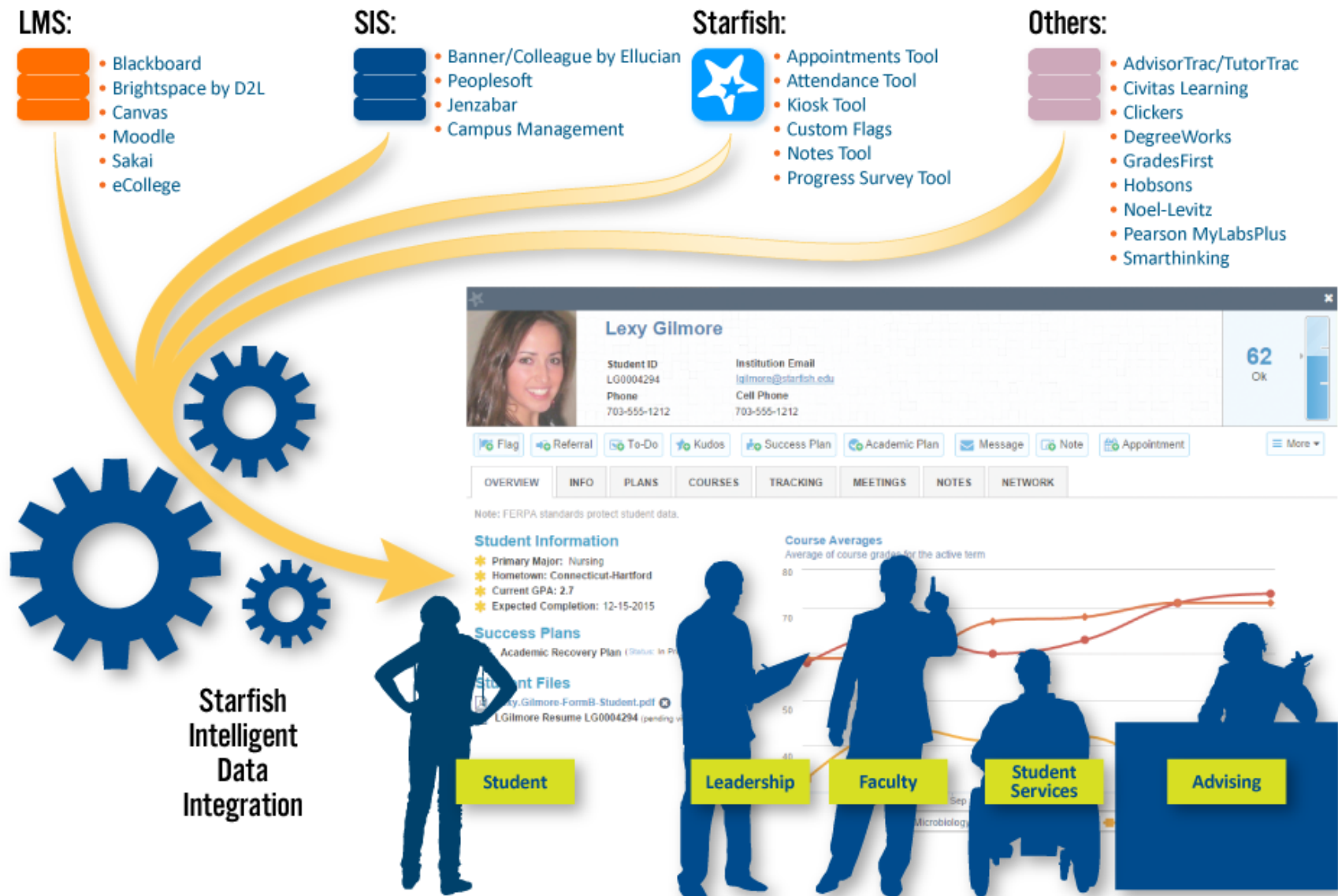
LMS Blackboard += Brightspace by D2L += Canvas += Pearson eCollege += Remote-Learner +=	SIS & DEGREE AUDIT Ellucian = PeopleSoft = Jenzabar = Campus Management = College Source *	STUDENT SERVICES TECH RedRock *= Gradesfirst =
ASSESSMENT Mapworks Noel-Levitz += ETS +, ACT, Campus Labs	STARFISH	ANALYTICS Civitas Learning + EAB * PAR +=
PUBLISHERS Pearson MyLabsPlus += McGraw Hill Cengage	STUDENT SERVICES Pearson Smarthinking += Ever Fi Inside Track Student Resources Svcs +=	CALL CENTER Blackboard += Ruffalo Cody * Greenwood & Hall +

+ Current Partner

* Working on Partnership

= Success obtaining data/working together

Creating Student-Centric Action



Starfish® Enterprise Success Platform™



Starfish **EARLY ALERT**™

Learn More, Earlier, About Your Students

- Let both **people** and **systems** trigger alerts
- Faculty-friendly progress surveys
- Customize unlimited **flags** and **Kudos**

Starfish **CONNECT**™

Make it Easy for Students to Engage

- Embedded **services catalogues** and **kiosks**
- Simple **appointment** tools that sync with calendars
- Capture **notes**, tasks, **Referrals** and **Success Plans**

Starfish **ADVISING**™

Point Students in the Right Direction

- Deploy **Academic Plans** based on custom templates
- Show students the impact of their choices
- Track student's changing goals and enrollments



Starfish **INSIGHT**™

Measure Your Efforts


- Leverage a leading business intelligence engine
- Extensive department-specific **dashboards**
- Automated **report** generation and delivery


Student View: What's next for my success?


[Home](#) [Services](#)


 Lexy Gilmore  [logout](#)


System Announcement: Fall course approvals are required for registration and must be in by the end of the month.

 Dashboard



 My Success Network



 Request Help

 Courses

 Plans



PAST DUE


 **Create Academic Plan** 



 Due 11/01/2014
 3 Days Past Due



TODAY **11/05/2014**

9:00 am



 **Tutoring Referral** 




 Lab Skills Refresher



 **Behavior Concern** 



 Success Skills Seminar (SRV101)
 From Yasmin Gold on 11/04/2014 and 6 [more...](#)

10:00 am


 **General Biology (BIO101)** 




 **Assignment Due:** Chapter 6 Questions
 Yasmin Gold
 300 Main Hall



 **Appointment** 



 Reason: Career Advice  Yasmin Gold



Recent Kudos







-  Grade above 90
-  Significant Progress
-  Team Leader


 **Tuition Due** 



 Due 11/04/2014
 1 Days Past Due



 **Attendance Concern** 



 Missed 2 class meetings
 General Biology (BIO101)


 **Work Life Interfering** 

 Raised on 11/04/2014 by Yasmin Gold



 **Failed Assignment** 


 Raised on 11/04/2014
 Success Skills Seminar (SRV101)


 **Visit Academic Advisor** 


 Raised on 11/04/2014 by Yasmin Gold



Student View: Status and help, unique to each class

[Home](#) [Services](#)  Lexy Gilmore  [logout](#)




 **System Announcement:** Fall course approvals are required for registration and must be in by the end of the month.




 **Courses**


Active 




 **General Biology II (SCI-BIOL201-600-201403)** 

[NETWORK](#) [GRADES](#) [ATTENDANCE](#) [NOTIFICATIONS](#) [MEETINGS](#)

**Yasmin Gold**
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 Starfish2@ucmail.uc.edu [INSTRUCTOR](#)



**Paul Jackson**
 757-622-4487
 Paul.Jackson@starfishcollege.e... [INSTRUCTOR](#)

 **Service**


**2**
 Grade above 90
 Significant Prog...

Yasmin Gold


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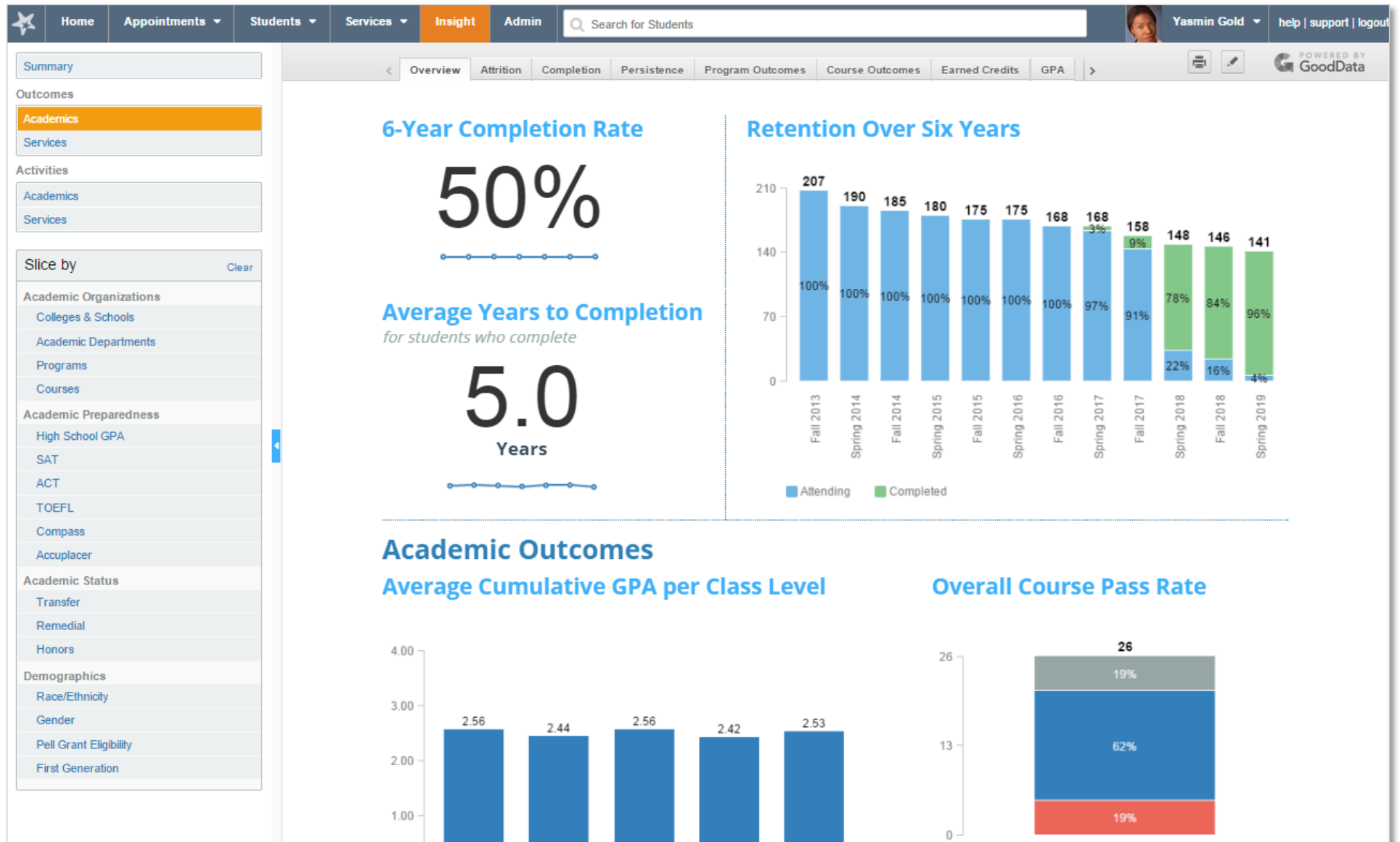
Availability
Gold's Weekly Advising: Mon Nov 10 7-8AM
Gold's OH: Tue & Thu 9-10AM
New Student Orientation: Wed Nov 12 5-6PM



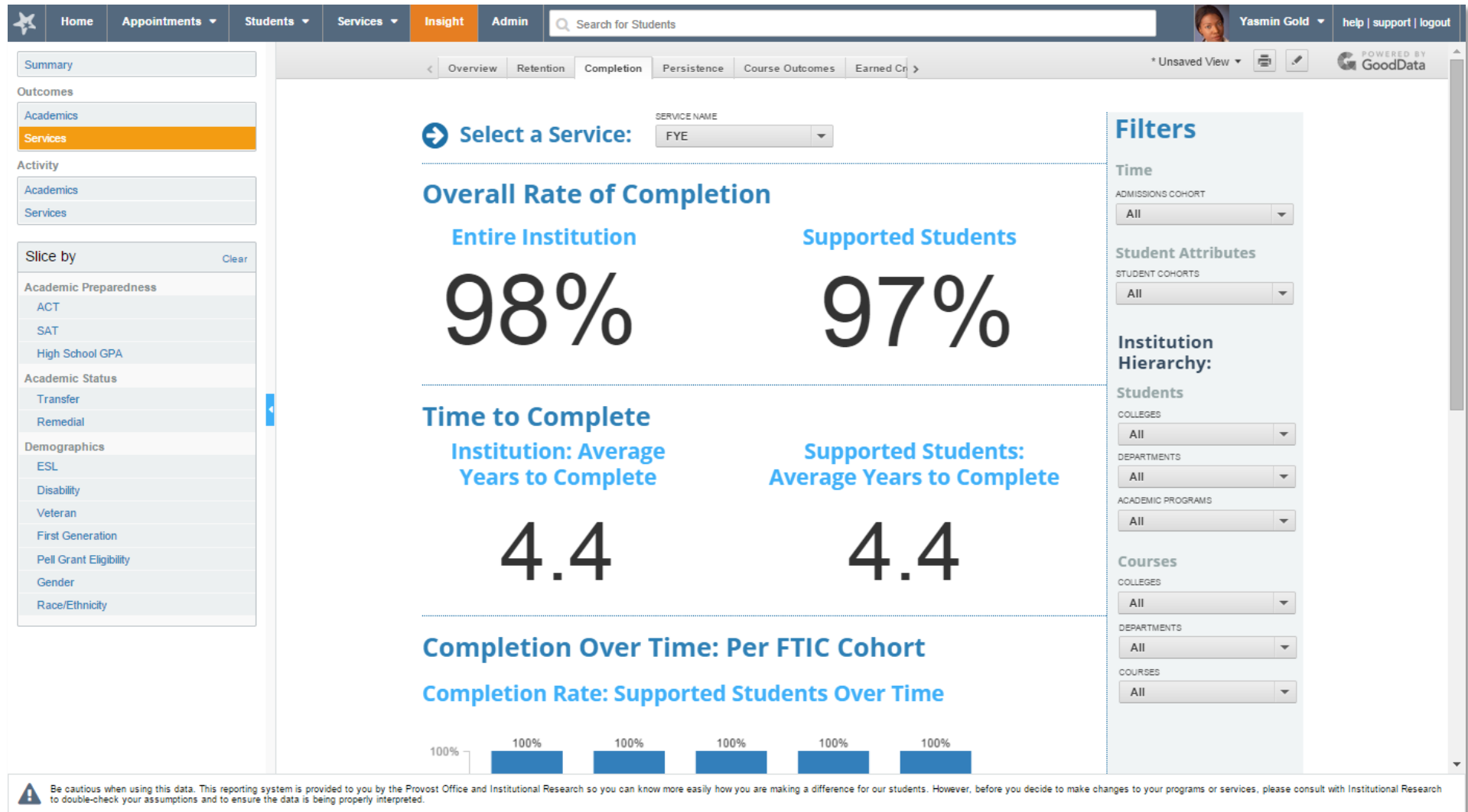
Assignment	Grade	Status
Quiz 1	85% (85/100)	Submitted
Essay 1	77% (77/100)	Submitted
Quiz 2	84% (84/100)	Submitted
Essay 2		Past Due
Midterm		11/10/2014



Executive view: Analysis of outcomes by cohort



Executive view: Analysis of impact of initiatives: FYE



2014: Starfish by the Numbers



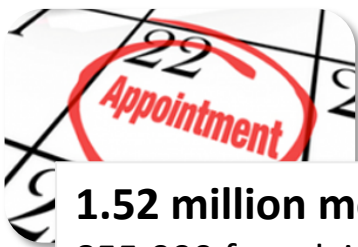
4.5 million students

20% of US students
1.6m impacted directly



2.25 million flags raised on 676,000 students

1.15m flags raised by hand
873,000 kudos on 427,000 students
144,000 kudos on demand
136,000 referrals + to dos (follow ups)



1.52 million meetings arranged

855,000 for advising
409,000 for tutoring
63,000 for instructor office hours



3.7 million notes (excl. emails)

2m general notes
512,000 comments on appointments
156,900 flags cleared with notes

The Starfish Community: Diverse & Collaborative



Case Studies

NORTHEAST WISCONSIN TECHNICAL COLLEGE	PAUL SMITH'S COLLEGE	YOUNGSTOWN STATE UNIVERSITY
Two Year Public Technical College	Four Year Private College offering bachelors and associate degrees	Four Year Public, Open Access
Client since 2013	Client since 2009	Client since 2011
10,000 students	1,000 students	15,000 students
Starfish CONNECT™ Starfish EARLY ALERT™ Starfish ADVISING™ Starfish INSIGHT™ (charter)	Starfish CONNECT™ Starfish EARLY ALERT™ Starfish ADVISING™	Starfish EARLY ALERT™ Starfish INSIGHT™ (charter)
<ul style="list-style-type: none"> Gateway course pass rates increased to 70.7% in 2013-2014 (up 7.6 percentage points since 2009-2010) 	<ul style="list-style-type: none"> 2014: +5% bachelors completion; +18% associate completion \$4m more kept in 4 years 	<ul style="list-style-type: none"> In spring 2014, YSU undergraduates completed 85.2% of the courses they attempted, up from 78.4% in fall 2011
<p><i>"Using the Starfish platform, employees across the College are increasingly able to record, share, and act upon information to improve student outcomes."</i></p> <p>- Lori Suddick, Vice President for Learning</p>	<p><i>"Our Comprehensive Student Support Program – powered by the Starfish system – has had a profound impact the success of our students."</i></p> <p>- John Mills, President</p>	<p><i>"The outreach initiatives from using the Starfish platform have truly impacted our students' engagement with University resources and progress toward degree completion."</i></p> <p>– Ikram Khawaja, Interim President (2014)</p>

What Needs to Change?

1. More colleges need similar systems
 - Holistic and open
 - Don't just find the students at risk, manage the problems to resolution
 - Support the American Way: best way to achieve success, not prevent it
2. Colleges need help with change management of these systems – campus culture determines success
 - System fatigue
 - Many departments don't trust one another
3. Research data needs to be correlated and shared
 - Student Success Taxonomy
4. Rigorous evaluation needs to be easier
5. Open architectures need to be encouraged
 - Grades & Registration data ✓
 - Tutoring ✓
 - Advising ✓
 - Predictive analytics ✓
 - Career counseling
 - Financial counseling
 - And many more