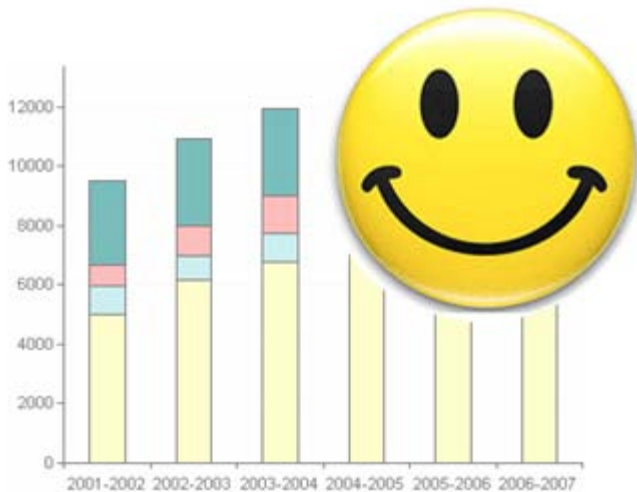


# How to Slice and Dice Your Way to **Data Happiness**

Data Warehousing Case Studies



Michael Taft

# Data Happiness: an Outline

Data Challenges

What is Data Warehousing?

Case Studies

- Southwest Texas
- Bunker Hill

Questions



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# Webinar Series

- Dashboards
- Program Review
- Remediation / Gatekeeper Analysis
- Geospatial Analysis
- Data Integrity
- HR, Finance

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U.S. Falls Behind in Degree  
At 2-Year Colleges, Students Eager but Unready

U.S. Falling Behind on  
Education and **Lacks Data,**  
Report Card Finds

THE CHRONICLE  
of Higher Education

Report Says United States Lags in Key Education Indicators

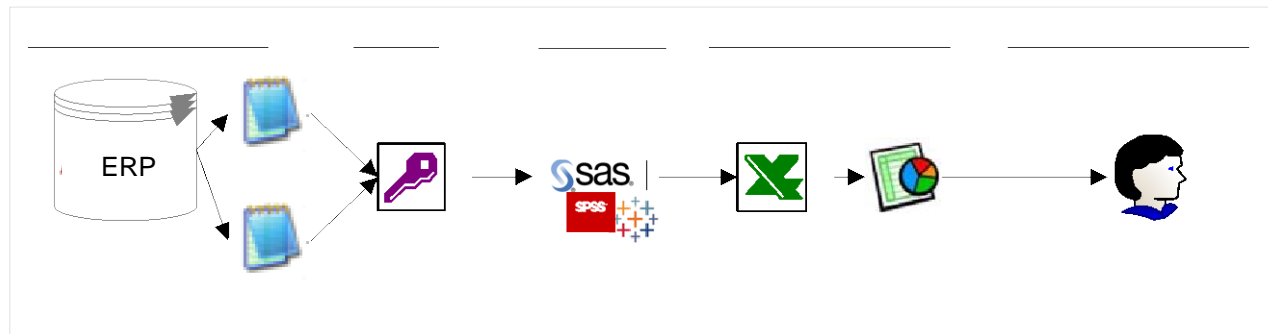
**A TEST OF LEADERSHIP**

Charting the Future of U.S. Higher Education

A Report of the Commission Appointed by  
Secretary of Education Margaret Spellings

**zogotech**  
Innovating Higher Education

# Anatomy of a Data Request

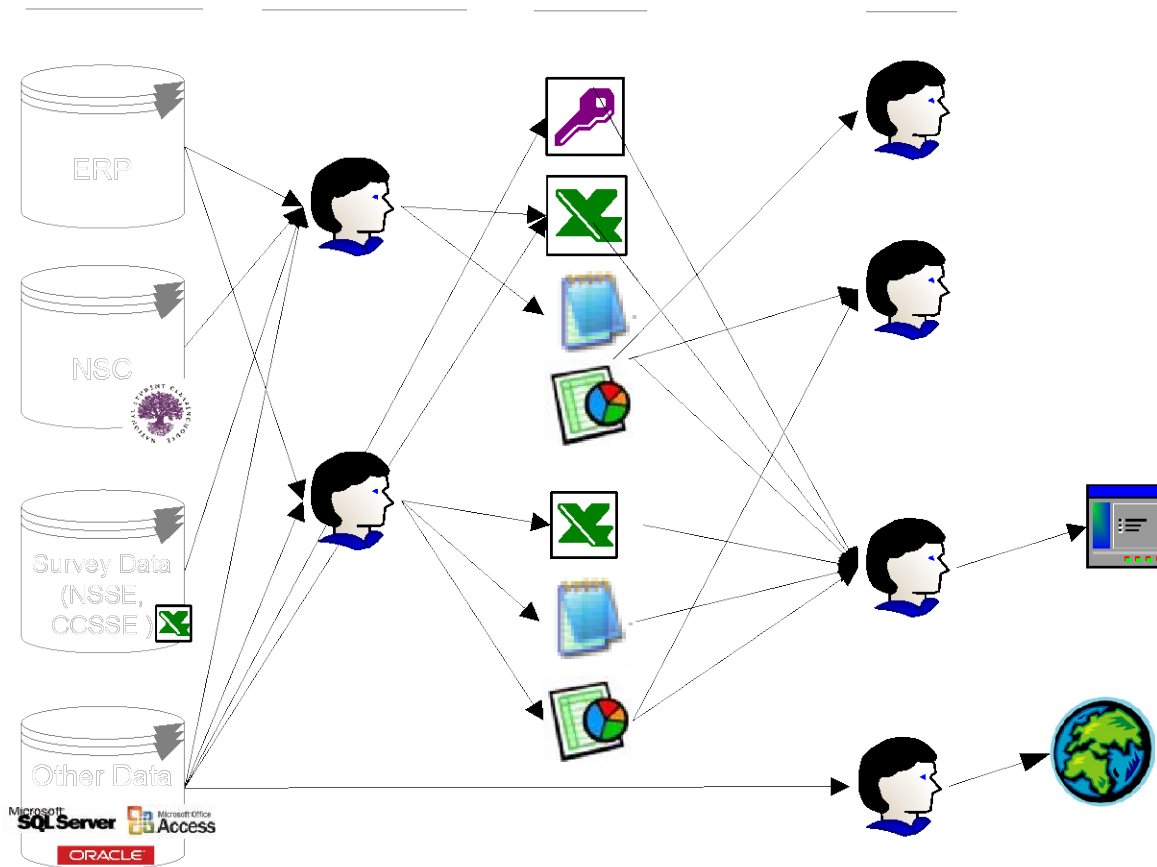


- Spend a lot of time **Gathering** rather than **Analyzing** data
- Reporting tools help, but
  - Longitudinal analysis?
  - Obscure field names
  - Rules

```
SELECT STUDENT.ACAD.CRED WITH STC.TERM EQ '2008SP' OR  
(STC.TERM EQ '' AND STC.CURRENT.STATUS.DATE BETWEEN 110507  
042808)
```

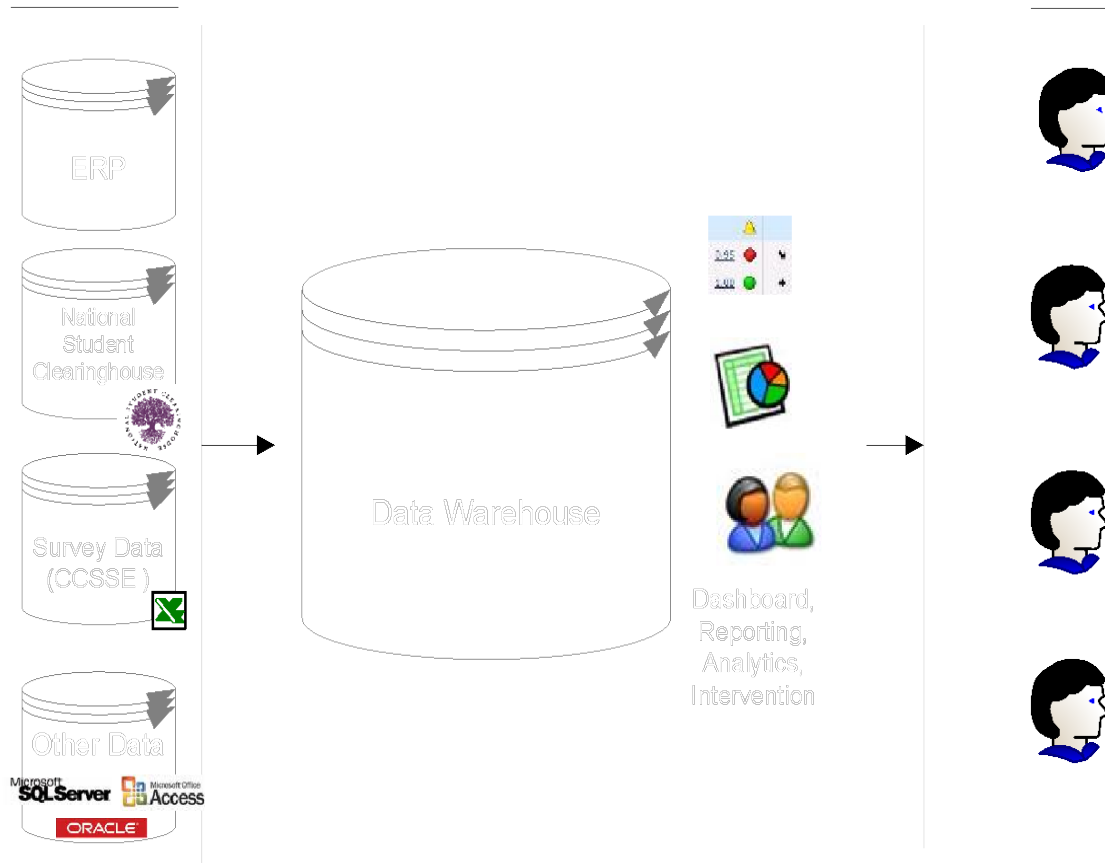
```
DOWNLOAD STUDENT.ACAD.CRED @ID STC.PERSON.ID STC.TERM  
STC.COURSE SCS.COURSE.SECTION STC.VERIFIED.GRADE
```

# Typical Data Flow



- IR, IT overwhelmed with requests > Delays > Renegade Reporting
- Inconsistent and Changing Data, Data Silos

# Data Warehouse Data Flow



- IR, IT Control ETL process, data dictionary (pipe / faucet)
- One version of the truth, End user access

# Data Warehousing Details

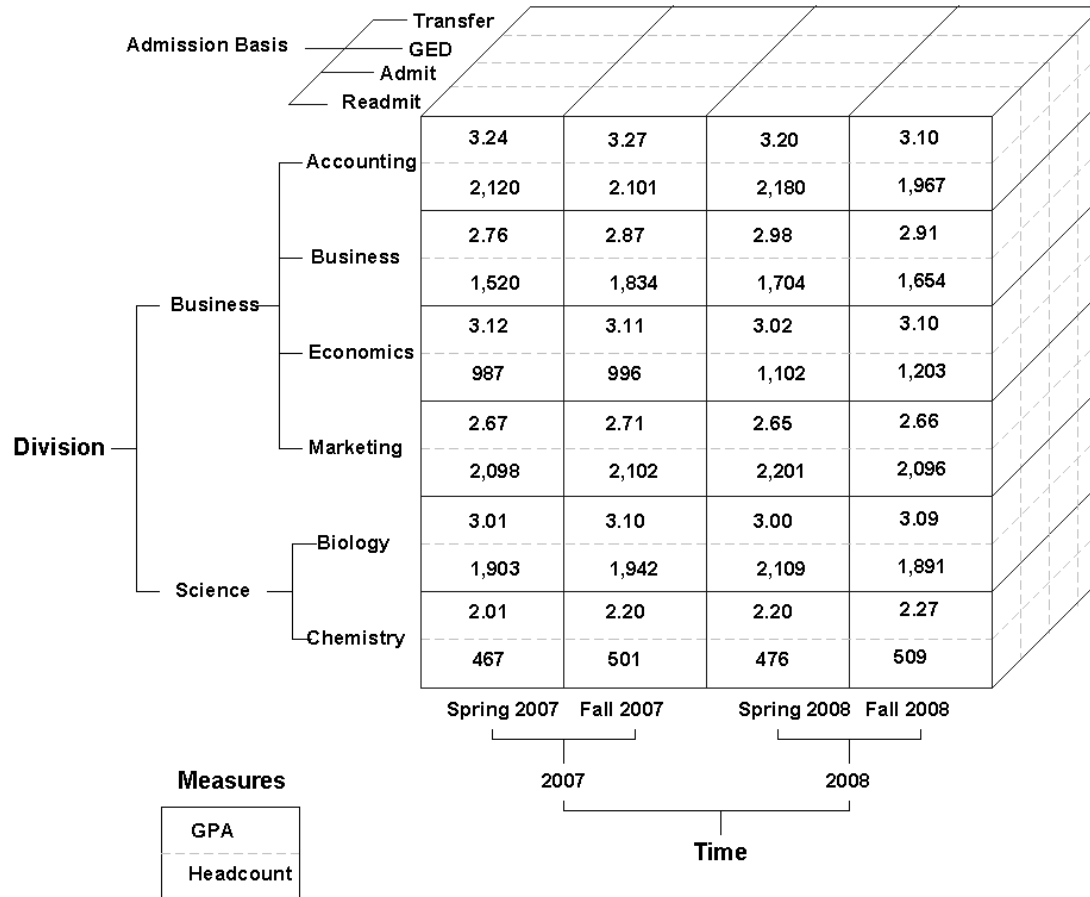
Extract, Transform, Load (ETL)

OLAP Cubes

# ETL Process



# Sample OLAP Cube



# Data Consumers



## Executive

dashboards, subscription reporting



## Research

in-depth analysis



## Student Services

at-risk intervention, student services

# Case Study: Southwest Texas

		Score	Trend
<b>Institutional Score</b> (weighted average)		86	↗

## Details (weighting factor)

1	<a href="#">Student Access and Success</a> (30%)		92	↗
2	Financial and Administrative Stability (20%)		63	↗
3	Economic Responsiveness (15%)		91	↘
4	Community Engagement (15%)		96	↘
5	Diversity and Cultural Competency (10%)		83	↗
6	Operational Strength (10%)		94	↗

# Too Much Data, Not Enough Information

## John Alvarez

Date	Test	Score
4/14/2007	ACCPW	83
4/14/2007	ACCPWS	7
2/17/2007	ACCPM	70
2/17/2007	ACCPW	62
2/17/2007	ACCPWS	6
10/7/2006	ACCPM	38
8/19/2006	ACCPM	35
7/12/2006	THEAM	228
5/20/2006	ACCPM	49
1/14/2006	ACCUPLACER	
1/14/2006	ACCPM	21
1/14/2006	ACCPM	0
1/14/2006	ACCPWS	7
1/14/2006	ACCPW	59
11/23/2005	THEAM	188
11/23/2005	THEAW	180
11/23/2005	THEAR	237
9/1/1989	GRAND	0

term	sectionName	grade
2006FA	ENGL-1302-AEP04	Dropped
2006FA	ENGL-1302-AEP05	A
2006FA	HECO-1322-BEP02	B
2006SP	MATH-0301-AEP03	Dropped
2006FA	MATH-0302-AEP03	B
2007SP	MATH-0303-AEP04	Dropped
2007SP	MATH-0303-EEP01	Dropped
2006SP	PSYC-2301-AEP01	A
2006SP	PSYC-2314-BEP01	B

Looking at class and test history, impossible to see where student is in dev ed sequence

# Solution

- Logistical regression on scores
- Incorporate grades
- Higher grades = higher scores

## Test History

Date	Test	Score
4/14/2007	ACCPW	83
4/14/2007	ACCPWS	7
2/17/2007	ACCPM	70
2/17/2007	ACCPW	62
2/17/2007	ACCPWS	6
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11/23/2005	THEAR	237
9/1/1989	GRAND	0

## Class History

term	sectionName	grade
2006FA	ENGL-1302-AEP04	Dropped
2006FA	ENGL-1302-AEP05	A
2006FA	HECO-1322-BEP02	B
2006SP	MATH-0301-AEP03	Dropped
2006FA	MATH-0302-AEP03	B
2007SP	MATH-0303-AEP04	Dropped
2007SP	MATH-0303-EEP01	Dropped
2006SP	PSYC-2301-AEP01	A
2006SP	PSYC-2314-BEP01	B

## Bottom Line

Latest Subject Levels:

Math: 285 Level 2

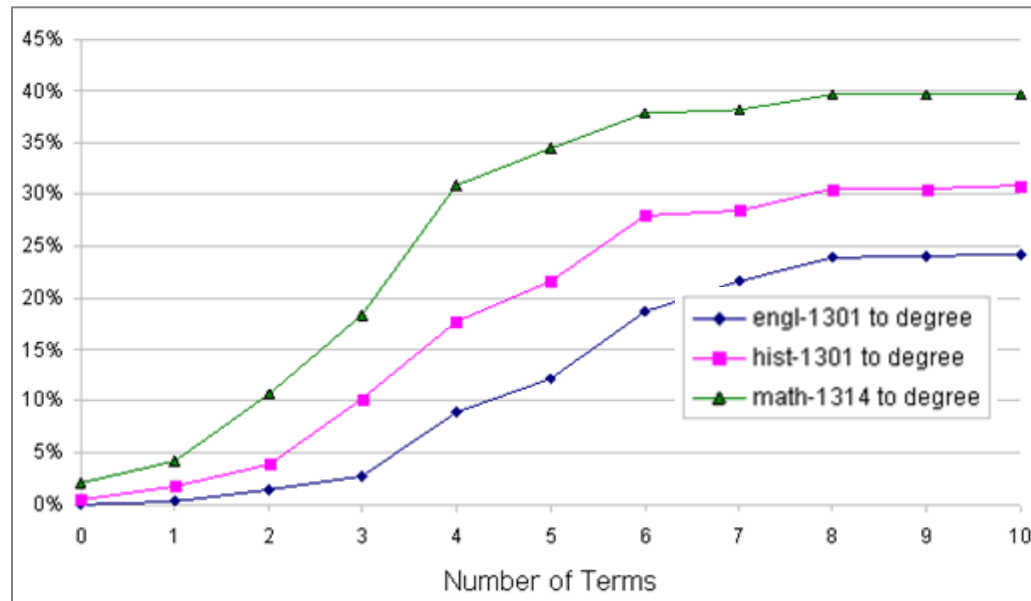
Reading: 475 Post-Gateway

Writing: 375 Post-Gateway



# Time Series Analyses

## Conditional Probabilities



Above: Southwest Texas Junior College, an AtD school, used Completion Point Reporting to show the correlation between suspected gatekeeper classes and graduation. Within 4 terms of completing College Level math (in green) 30% of students have graduated

# Remediation Analysis

Starting Cohort ▾						
FA		Latest Math Sublevel ▾				
		Level 0	Level 1	Level 2	Pre-Gateway	Post-Gateway
FTIC Math Sublevel ▾	Duplicated Headcount	Duplicated Headcount	Duplicated Headcount	Duplicated Headcount	Duplicated Headcount	Duplicated Headcount
Level 0	39.49%	26.82%	18.20%	12.03%	3.46%	
Level 1		28.77%	24.21%	37.34%	9.68%	
Level 2			40.39%	18.61%	41.00%	
Pre-Gateway				49.74%	50.26%	
Post-Gateway					100.00%	
Grand Total	5.34%	13.16%	18.09%	34.28%	29.13%	

Above: Shows which level of Math students started in on left (FTIC Math Level) versus where they are now on top (Latest Math Level)

# Culture of Inquiry in Student Services

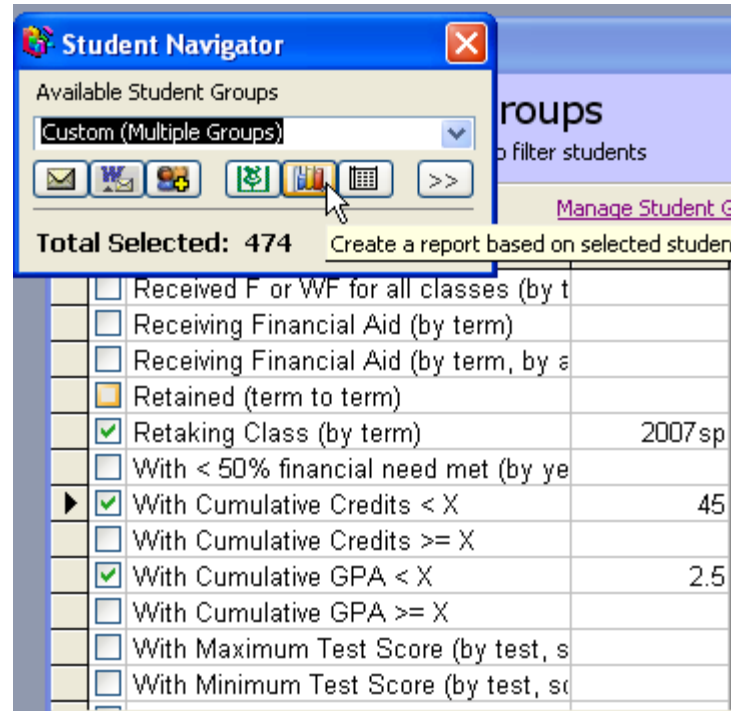
Operational

Culture of Inquiry



# Ad-hoc Query and Reporting

- No query language to learn
- Click to combine higher-level concepts to build query



Student Navigator

Available Student Groups

Custom (Multiple Groups)

Total Selected: 474

Create a report based on selected students

<input type="checkbox"/>	Received F or WF for all classes (by term)	
<input type="checkbox"/>	Receiving Financial Aid (by term)	
<input type="checkbox"/>	Receiving Financial Aid (by term, by s	
<input type="checkbox"/>	Retained (term to term)	
<input checked="" type="checkbox"/>	Retaking Class (by term)	2007 sp
<input type="checkbox"/>	With < 50% financial need met (by ye	
<input checked="" type="checkbox"/>	With Cumulative Credits < X	45
<input type="checkbox"/>	With Cumulative Credits >= X	
<input checked="" type="checkbox"/>	With Cumulative GPA < X	2.5
<input type="checkbox"/>	With Cumulative GPA >= X	
<input type="checkbox"/>	With Maximum Test Score (by test, s	
<input type="checkbox"/>	With Minimum Test Score (by test, s	

Above: Identifying students who may be at risk: there are 474 students who are retaking a class, have < 45 credits and have < 2.5 GPA. Click to contact these students, run a report, etc.

# Student Engagement

- Culture of Evidence
- ex: At-risk intervention
- ex: Students who withdrew by major

The screenshot displays the Student Navigator interface. On the left, under 'Available Student Groups', the group 'Increased Credits in Current Term' is selected, with a total of 97 students. Below this is a table of 'Class Enrollments' with columns for Student ID, Name, Term, and Class-S.

Student ID	Name	Term	Class-S
300960	Abel, Aaron	2006FA	BIOL-24
		2006FA	MATH-4
300978	Alvarez, Randy	2006FA	MATH-4
		2006FA	ENGE-0
311619	Andrews, Tammy	2006FA	ENGL-1
311666	Bagdon, Walter	2006FA	ENGE-1
300395	Balint, Patricia	2006FA	ACCT-2
402000	Banner, Gloria Jane	2006FA	CDEG-1
		2006FA	CDEG-2
		2006FA	CDEG-1

On the right, an email composition window is open. The 'To' field is empty, and the 'Cc' field contains a list of email addresses: Aaron.Abel@college.edu; Randy.Alvarez@college.edu; Tammy.Andrews@college.edu; Walter.Bagdon@college.edu; Patricia.Balint@college.edu; Gloria.Banner@college.edu; Robin.Baza@college.edu; Diane.Beil@college.edu. The subject is 'Significant increase in credits'. The body of the email reads:

Dear Student,

We have noticed that you have significantly increased your enrolled credits from last semester. Congratulations on your enthusiasm. This is a big jump and we want to help you make this coming semester as successful as possible.

Please see an advisor as soon as possible to discuss the best ways to handle this increase course load.

Above: Identify students who may be at-risk because they have significantly increased their course load. Click the email button to contact them and record those contacts in a central location.

# Student Engagement

- Noel-Levitz retention variables
- Computed At-risk indicators
- Other information easily accessible in tabs
- Consolidate data silos

**Aaron Abel**

General Info | Contacts | Group | Address | Classes | Tests | Financial Aid | Degrees | NSC

**Photo**

White, Non-Hispanic M

Major: PREVN  
Age: 38  
Student ID: 7600960  
[SSN](#)

**Alerts**

At-risk indicators and other pertinent information about the student [Manage](#)

Alert
Student has at least 6 more registered credits than in previous long term
Student is currently enrolled in one or more developmental classes
Student has < 50% financial need met for current academic year

**Academic**

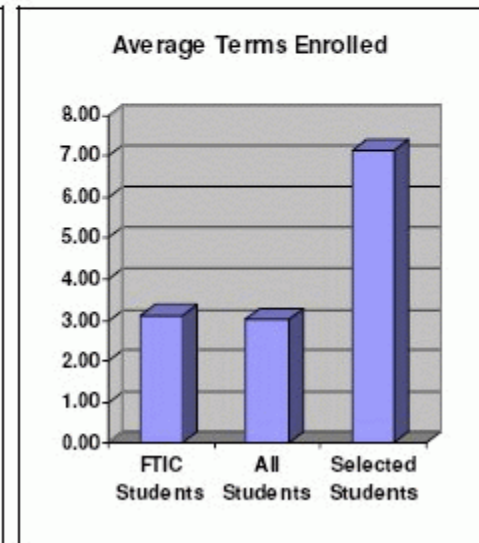
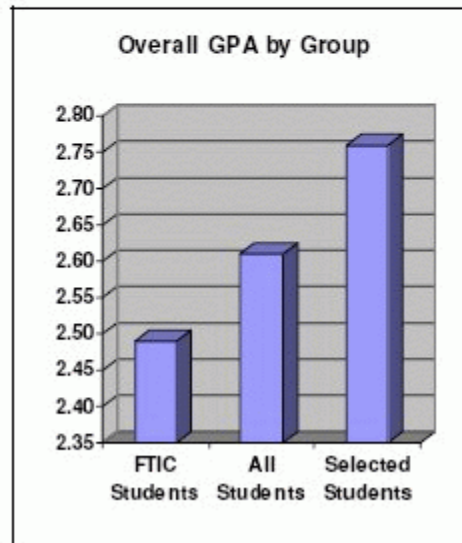
Start Term / End Term:	2004SP / --	GPA:	1.936
Admission Basis:	High School Graduate	Credits:	40

Gives advisors / faculty easy access to data to make data-driven decisions on an individual student basis (note: all information here is randomized)

# Assessment

Student Group	Count	GPA (Overall)	Average Terms Enrolled	Major Change Frequency
FTIC Students	9,511	2.49	3.12	0.38
All Students	19,450	2.61	3.01	0.40
Selected Students	2,140	2.76	7.13	0.18

- Compare Intervention efforts
- Show measurable success





This shows that the students served by this department had a higher GPA, were retained longer and changed their majors less frequently than two other comparison groups ('First Time in College' and 'All Students'). This can be used to show the impact of tutoring or other intervention programs, for example

# Questions and Answers

[www.zogotech.com/air](http://www.zogotech.com/air)

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