TEXAS

Creating Meaningful and Immersive Visualizations in Tableau: An Incremental Approach

Al Walser - UT Austin

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OUTLINE

This session is for IR professionals

Getting from here to there

Basic Tableau connectivity

Embedding your visualization

Unbox Tableau: THECB reports

Key points to remember

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Who is using Tableau or plans to?

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Getting from here to there

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Change is inevitable, but scary for some.

Year : 2014 (48)

- Section : Student (25)
- Section : SCH (6)
- Section : Finance (3)
- Section : Faculty (10)
- Section : Degree (4)

before tableau

Year : 2015 (53)

- Section : Student (31)
- Section : SCH (4)
- Section : Finance (3)
- Section : Faculty (10)
- Section : Degree (5)

after tableau

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Change is necessary, but scary for some.

Name
IMA_S_DistByLevelAge_Current
IMA_S_EnrlClassGender_Current
IMA_S_EnrlColDeptLvl_current
IMA_S_EnrlColLvlRaceGen_Current
IMA_S_EnrlFTPTStatus_Current
IMA_S_EnrlLvlRace_Current
IMA_S_EnrlLvlRes_Current
IMA_S_EnrlOrigResSum_Current
IMA_S_EnrlOrigRes_CountyStateCountry
IMA_S_EnrlRaceGen_Current
IMA_S_EnrlSemGen_current
IMA_S_FTICFlow_current
IMA_S_GpaUGColClassGen_Current
IMA_S_NewEnrlGroupRace_current
IMA_S_NewEnrlGroupRes_current
IMA_S_NewStuEnrlChart_current
IMA_S_ProfileFTIC_Current
IMA_S_ProfileUGTransfer_Current
IMA_S_TransferFlow_current
IMA_S_UGTransferFrom_Current
Student Characteristics

Data Source
FreshmenApps (IRRIS_SH_FTIC_AppAdmitEnroll)
IRRIS HouseMembers Extract
IRRIS_Confidentiality
IRRIS_FACULTY_PROMOTION_STAR
IRRIS_SH_DegreesConferred
IRRIS_SH_Faculty
IRRIS_SH_FacutlyStudentRatios
IRRIS_SH_SCH
IRRIS_SH_StudentDemographics
IRRIS_SH_TeachStaffStudentRatios
IRRIS_SH_TransferFlow
IRRIS_SH_UGInstructionalPatterns
IRRIS_SH_UndergraduateFlow
IRRIS_SH_UndergraduateFlow-Previous
TransferApps (IRRIS_SH_Transfer_AppAdmitEnroll)

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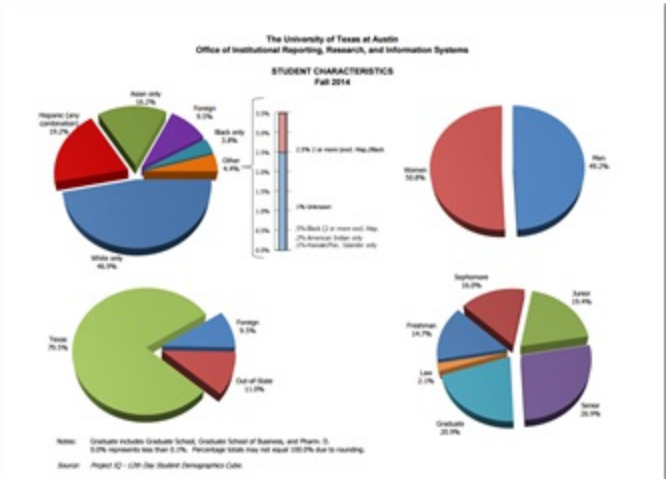
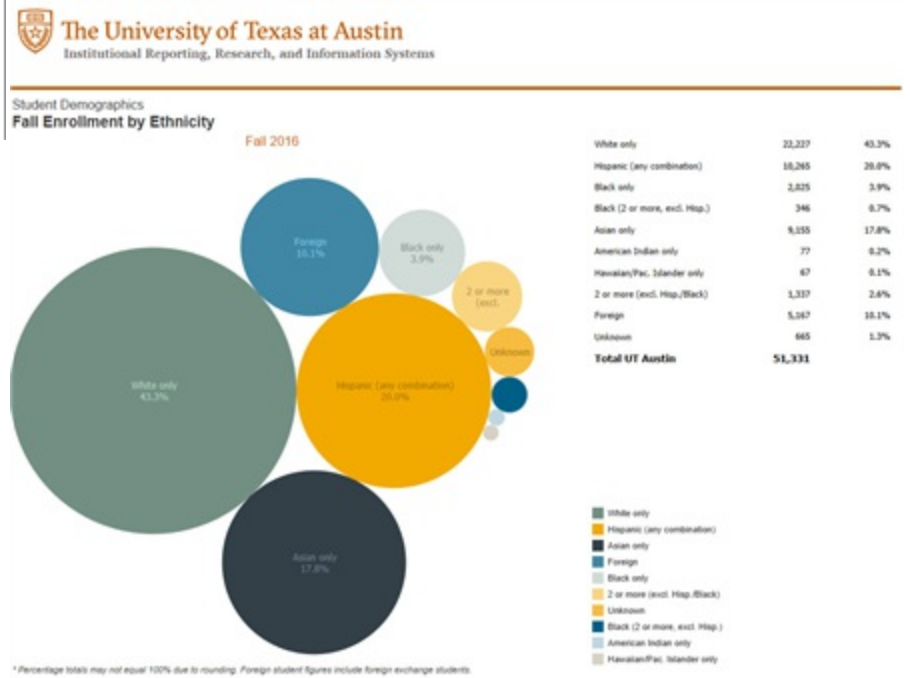


Same great data,
fresh new taste



Leverage existing
reports, re-imagine
with Tableau

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The University of Texas at Austin
Institutional Reporting, Research, and Information Systems

Approach change incrementally

Student Demographics

Profile of New Student Enrollment - Chart - Fall Semesters

Example: Adopt new methodologies such as adjusting charts so newest information is first.

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Statistical Handbook

Statistical Handbooks contain information about the most recent fall data as well as the prior academic year. For example, the 2009-10 handbook will have the fall enrollment data for 2009 and the academic year degree information for 2008-09. The Statistical Handbook provides information about UT Austin's student, faculty, staff, and degree characteristics.

1980-81 >	1981-82 >	1982-83 >
1983-84 >	1984-85 >	1985-86 >
1986-87 >	1987-88 >	1988-89 >
1989-90 >	1990-91 >	1991-92 >
1992-93 >	1993-94 >	1994-95 >
1995-96 >	1996-97 >	1997-98 >
1998-99 >	1999-00 >	2000-01 >
2001-02 >	2002-03 >	2003-04 >
2004-05 >	2005-06 >	2006-07 >
2007-08 >	2008-09 >	2009-10 >
2010-11 >	2011-12 >	2012-13 >
2013-14 >	2014-15 >	2015-16 >
2016-17 >		

We still offer our complete statistical handbook in PDF format (built in Tableau)

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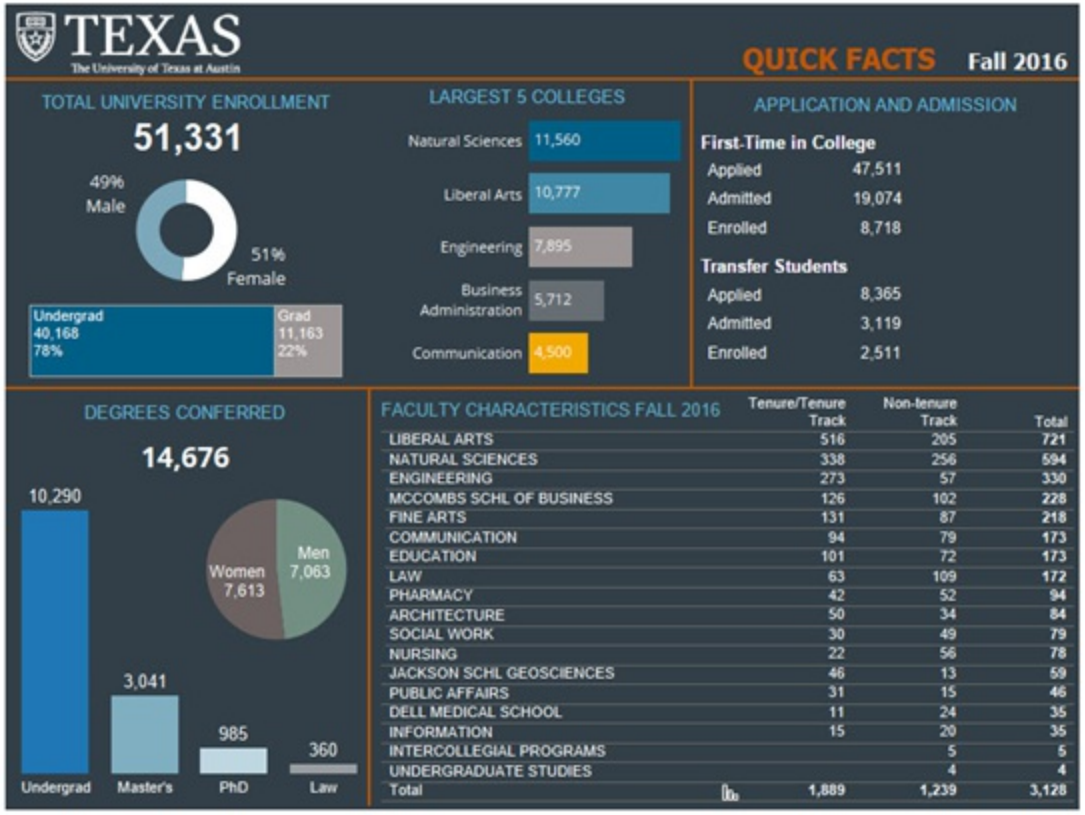
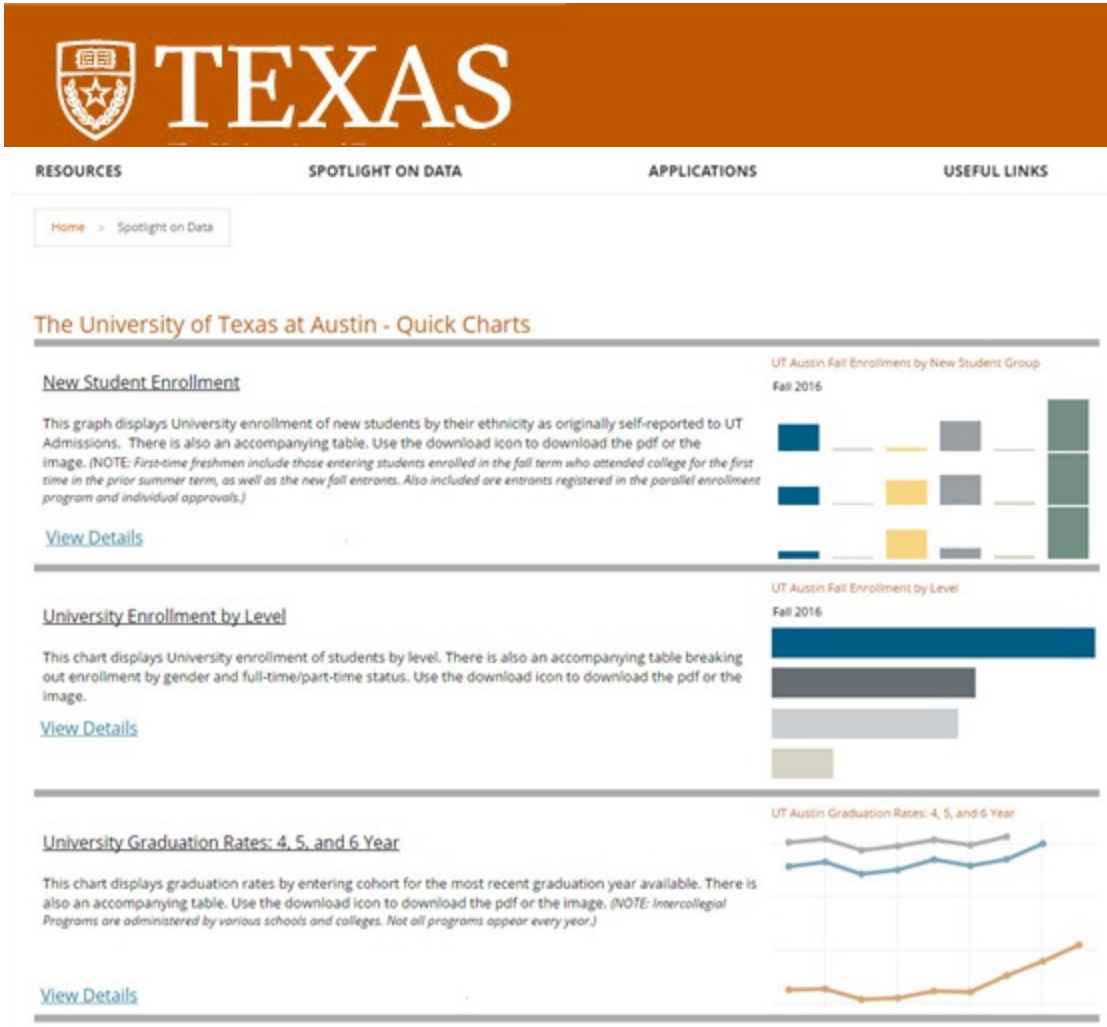
Office of Institutional Reporting,
Research and Information Systems

RESOURCES SPOTLIGHT ON DATA APPLICATIONS



We also built small, interactive and embedded visualization on our homepage for users to get accustomed to new data format.



Replace static charts with embedded Tableau Visualizations

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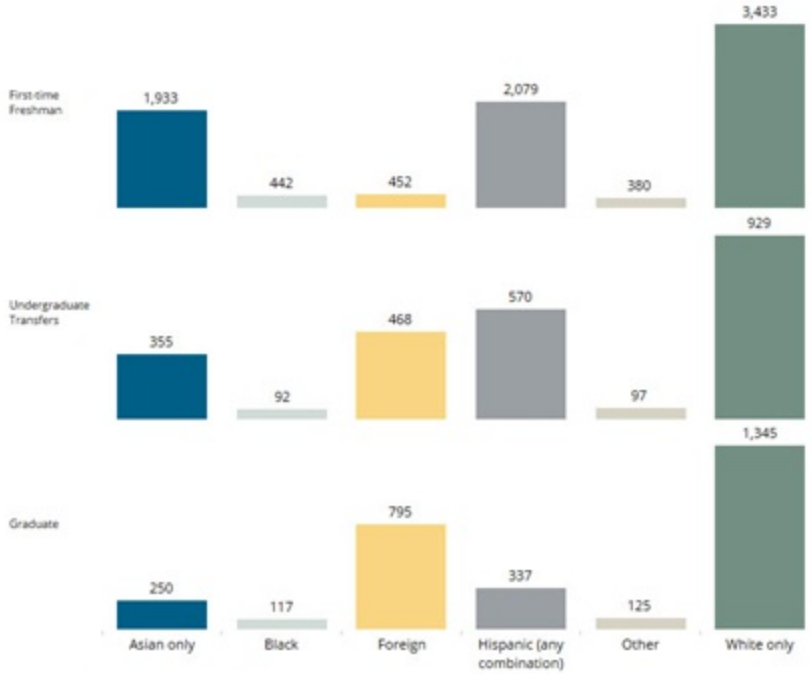
UT Austin Fall Enrollment by New Student Group

Fall 2016



Source: IRRIS - Cognos 12th Class Day Student Reports.

Notes: IPEDS definition. First-time freshmen include those entering students enrolled in the fall term who attended college for the first time in the prior summer term, as well as the new fall entrants. Also included are entrants registered in the parallel enrollment program and individual approvals. Undergraduate Transfers include fall entrants only. Graduate (Graduate School, Graduate School of Business, and Pharm. D.) and Law include those students enrolled in the fall term who entered graduate programs or Law School for the first time in the prior summer term, as well as new fall entrants.

Asian only · Black · Foreign · Hispanic (any combination) · Other · White only

To download the chart, click any where on the chart then click on the download button at the bottom of this page. To download the pdf, click anywhere in the table then click the download button at the bottom of this page.

Select College: (All)

Select Department: (All)

		Fall 2016
First-time Freshman	Asian only	1,933
	Black	442
	Foreign	452
	Hispanic (any combination)	2,079
	Other	380
	White only	3,433
	Total	**8,719**
Undergraduate Transfers	Asian only	355
	Black	92
	Foreign	468
	Hispanic (any combination)	570
	Other	97
	White only	929
	Total	**2,511**
Graduate	Asian only	250
	Black	117
	Foreign	795
	Hispanic (any combination)	337
	Other	125
	White only	1,345
	Total	**2,969**
Total		**14,199**

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Table of Contents

Quick Tableau Introduction
Downloading Data
- What
- Where

Filtering
- Selecting
- Removing
- Understanding

Making Selections
Columns/Row Header Functions
Toolbar Functions

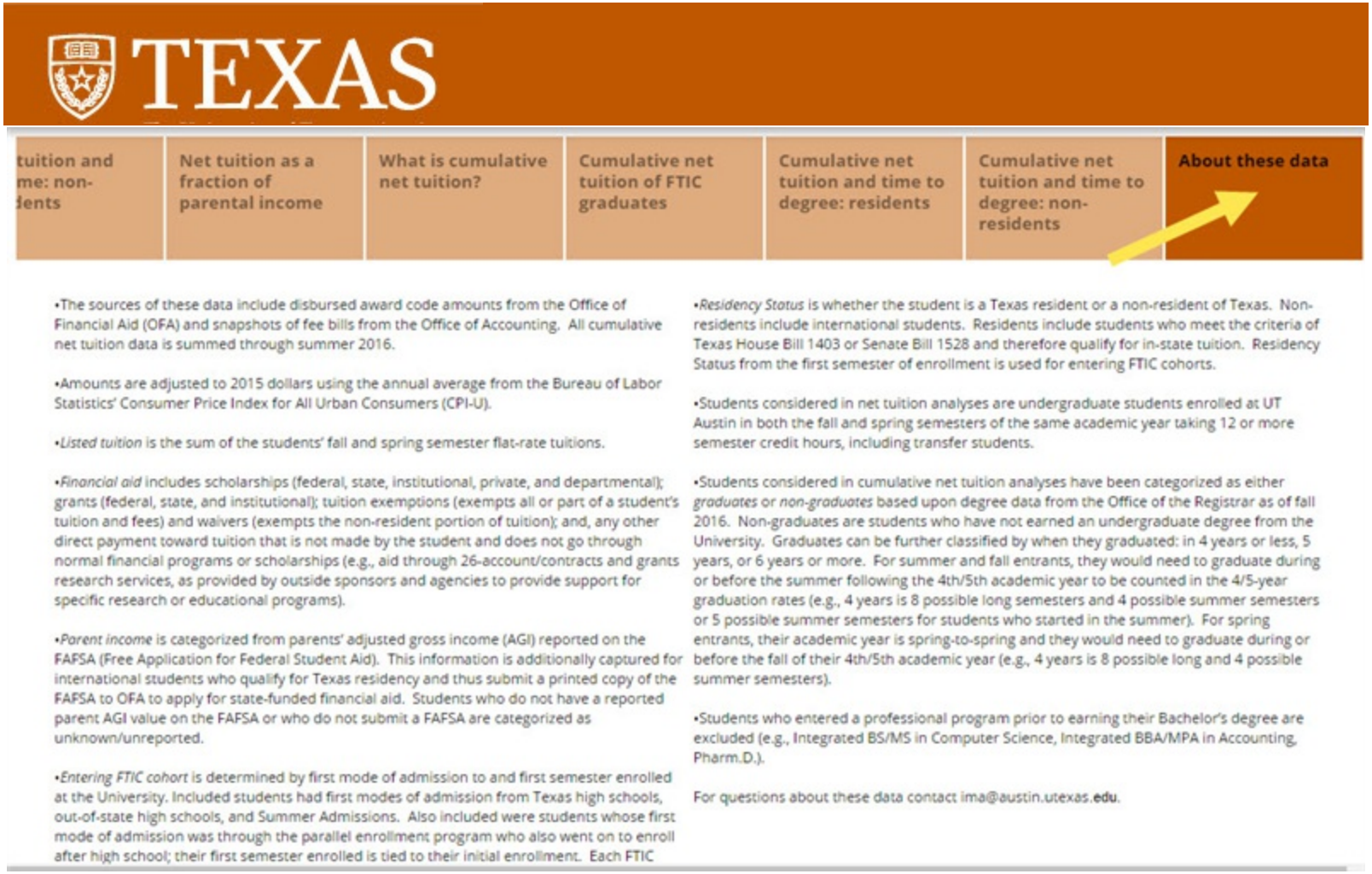
Tableau User Guide

Provide users with tools for success

Quick Tableau Introduction

The University of Texas at Austin
Institutional Reporting, Research and Information Systems

Tableau provides some helpful materials at their Starter kits.



Provide users with tools for success

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A few thoughts…

It’s never as simple as replacing a report - you have to retrain the brain

Once you start replacing, be sure to provide users with ”how-to” tools

Remember to adopt and adhere to best practices

Begin shifting responsibility to the user

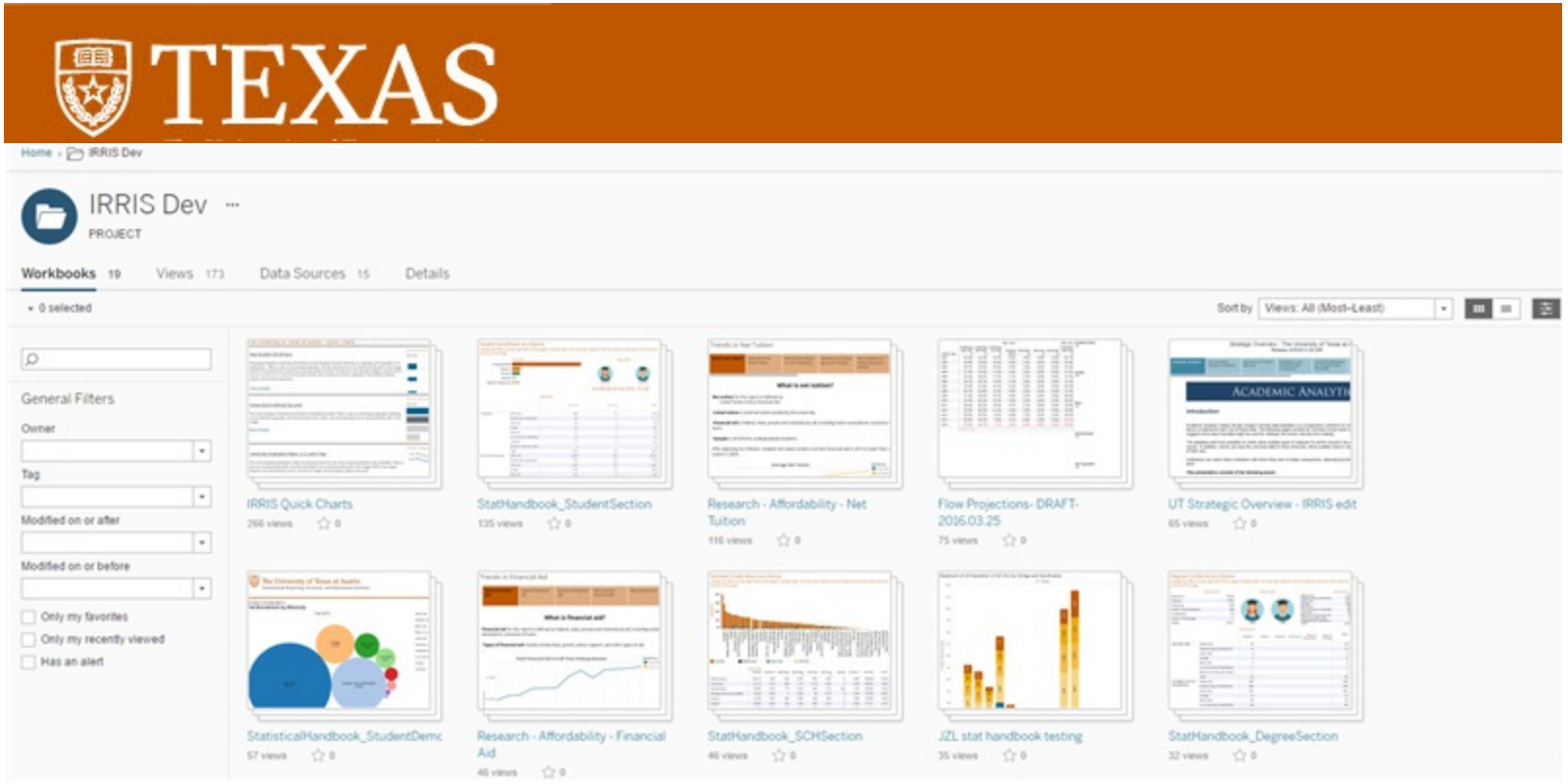
Be ready to defend your viz!

So, now you're ready to dig in.
First, a few tips.

Plan your migration
Prioritize which reports to upgrade
Consolidate/Eliminate redundancy
Develop best practices beforehand
Have a communication plan ready
Develop user guide or FAQ

Plan your connection
Existing warehouse
Flat file
Combination of both

Use Tableau efficiently
Calculated fields
Organize data fields



You can publish your visualizations via Tableau website

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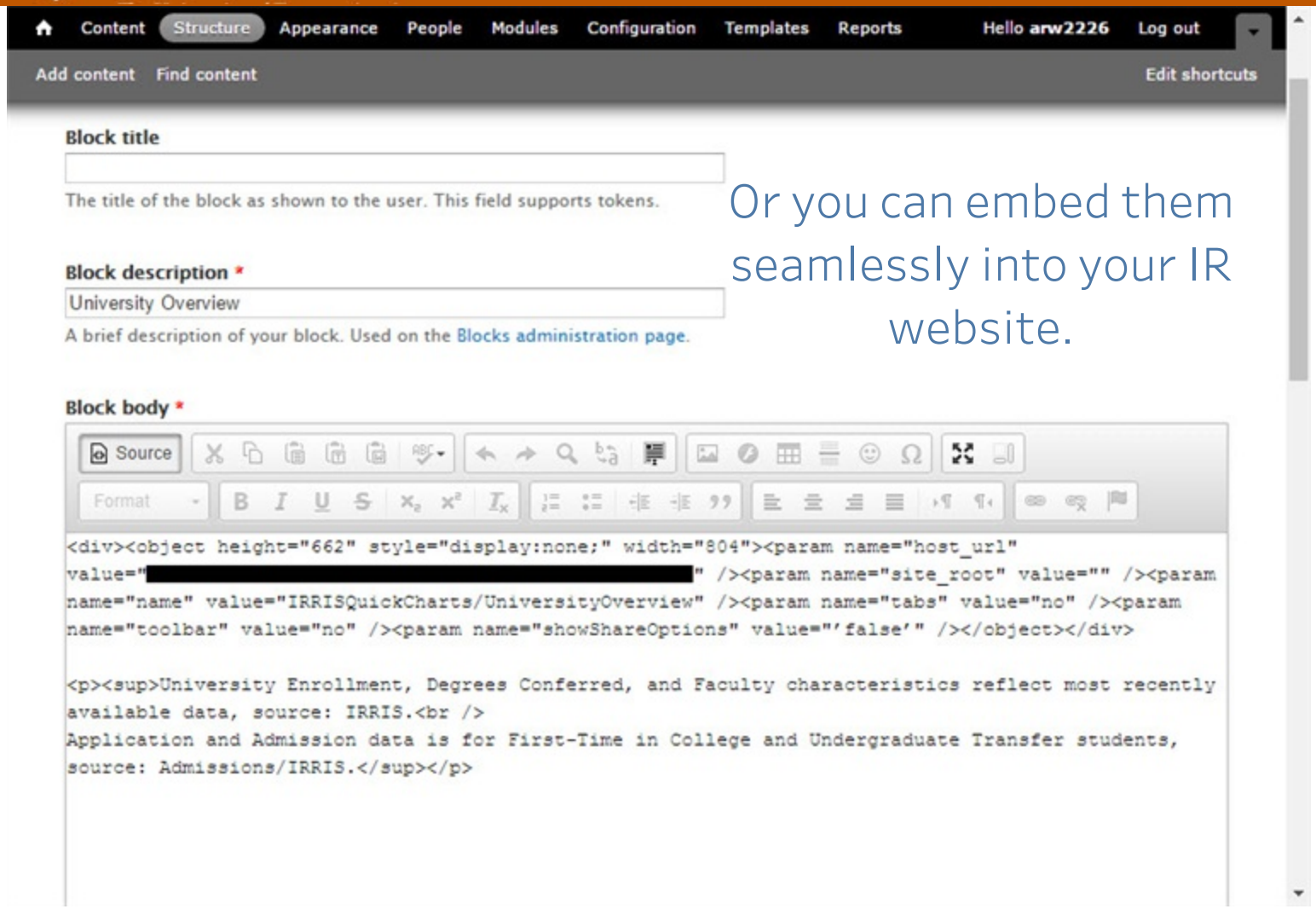

Or you can embed them seamlessly into your IR website.

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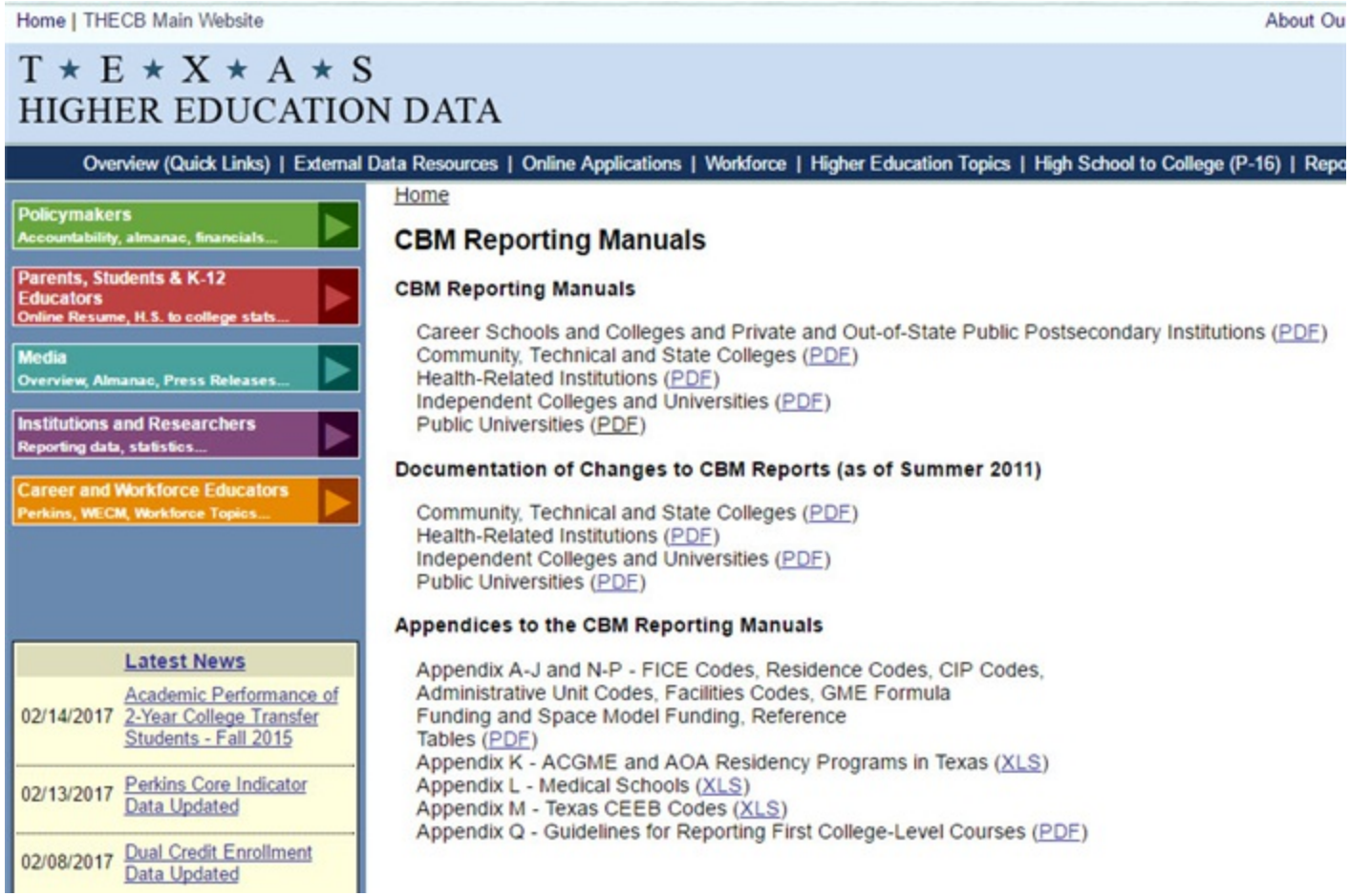
Time to unbox Tableau



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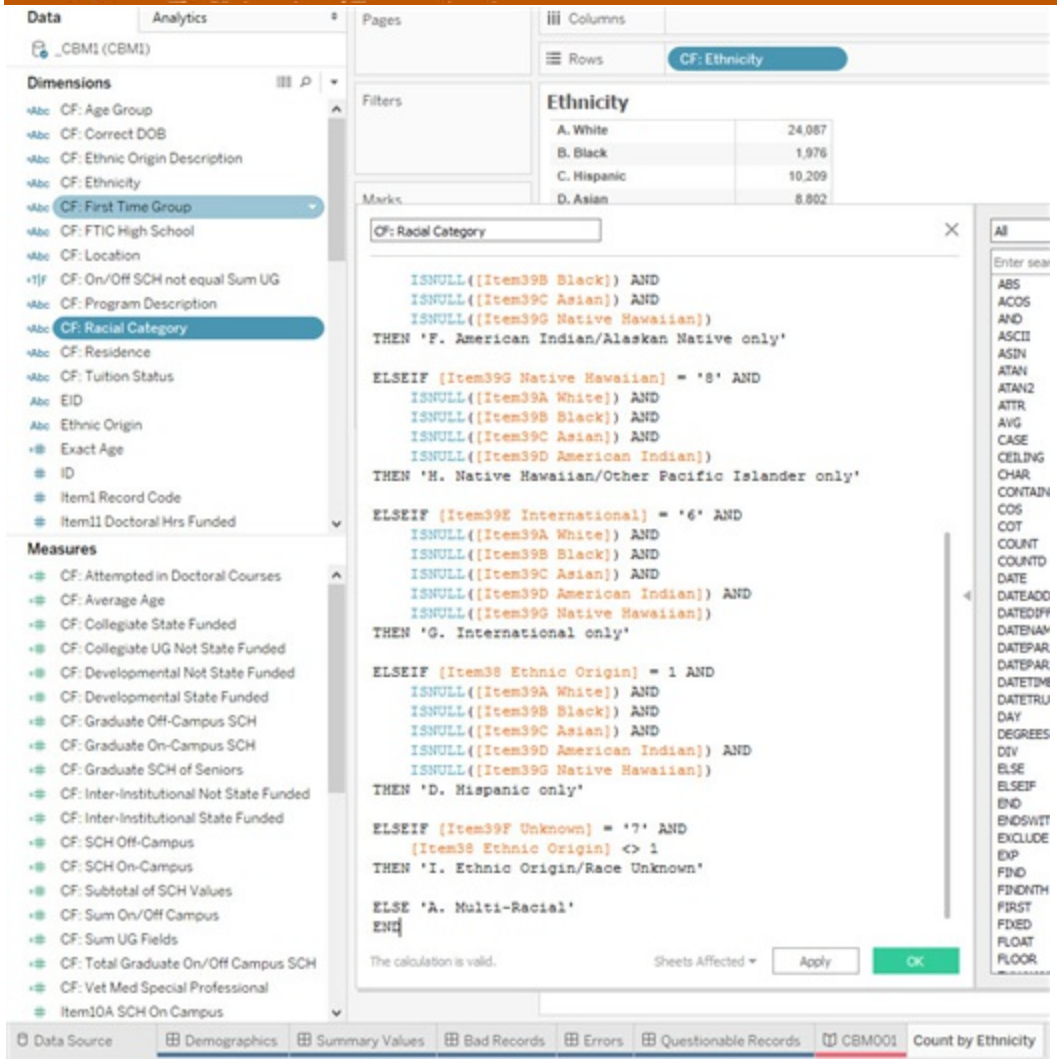

Organize your data and create calculated fields

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CBM001 Student Demographics

Ethnicity

A. White	24,087
B. Black	1,976
C. Hispanic	10,209
D. Asian	8,802
E. American Indian	96
F. Native Hawaiian	59
G. Multi-Racial	1,576
H. International	3,977
I. Unknown	530
Grand Total	51,312

Racial Category

A. Multi-Racial	1,876
B. White Only	29,521
C. Black only	2,116
D. Hispanic only	3,955
E. Asian only	8,927
F. American Indian/Alaskan Native only	330
G. International only	3,977
H. Native Hawaiian/Other Pacific Islander only	80
I. Ethnic Origin/Race Unknown	530
Grand Total	51,312

Age Group

A. Under 17	2
C. 18	6
D. 19-21	12,455
E. 22-24	23,273
F. 25-30	10,215
G. 31-35	3,222
H. 36-50	1,893
I. 51-64	215
J. 65 or older	31
Grand Total	51,312

Average age of student is 25

Classification

Freshman	7,539
Sophomore	8,225
Junior	9,930
Senior	13,828
Master's	5,352
Doctoral	4,818
Special Professional	1,620
Grand Total	51,312

Residence

A. Texas Counties	40,784
B. Other States	5,656
C. Foreign Countries	4,872
Grand Total	51,312

Gender

Male	25,249
Female	26,063
Grand Total	51,312

Ethnic Origin

A. Hispanic or Latino Origin	10,209
B. Not Hispanic or Latino Origin	32,255
C. Not Answered	8,848
Grand Total	51,312

Create custom counters
to use for reports and surveys.

Office of Institutional Reporting, Research, and Information Systems

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CBM001 Summary Values

By Program

A. Teacher Education (Init Cert. UG)	1,050
B. Teacher Education (Init Cert. Mast.)	32
D. Teacher Education (Post-Baccalaureate)	23
E. Nursing (ADN to BSN)	35
G. Nursing (initial RN Lic.- baccalaureate Lvl)	327
H. Nursing (initial RN Lic.- Masters Level)	57
Q. Special Professional-AUD	37
S. Special Professional-Law	1,088
U. Special Professional-PharmD	495
Grand Total	3,144

SCH

CF: Collegiate State Funded	519,353
CF: Collegiate UG Not State Funded	4,844
CF: Inter-Institutional State Funded	0
CF: Inter-Institutional Not State Funded	0
CF: Developmental State Funded	66
CF: Developmental Not State Funded	0
CF: Vet Med Special Professional	0
CF: Graduate SCH of Seniors	1,606
CF: Subtotal of SCH Values	525,869
CF: SCH On-Campus	643,899
CF: SCH Off-Campus	1,231
CF: Sum On/Off Campus	645,130
CF: Attempted in Doctoral Courses	38,063
CF: Graduate On-Campus SCH	119,188
CF: Graduate Off-Campus SCH	84
CF: Total Graduate On/Off Campus SCH	119,272

Tuition Status

A. Resident Tuition	38,726
B. Non-Resident Tuition	3,517
C. Tuition Exemption Tx Res (3)	1,667
E. Law (Resident)	723
F. Law (Non-Resident)	114
G. Resident Tuition (HB1403)	710
H. Resident Tuition Pending	183
I. Tution Wave Non-Res (E)	5,672
Grand Total	51,312

FTIC High School

A. Texas High School	6,274
B. Out-of-State High School	711
Grand Total	6,985

First Time Group

A. FTIC	6,986
B. Graduate/Professional	3,068
C. Transfer	2,325
Grand Total	12,379

Funding Limit

A. Students Affected by 45 Hour UG Limit	881
B. Students Affected by 30 Hour UG Limit	38,280
C. Not Affected by Limit	12,151
Grand Total	51,312

Location

A. On-Campus	51,198
B. Off-Campus	83
C. Duplicates	31
Grand Total	51,312

Using calculated fields, mimic CB edit report.

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CBM001 Bad Records

Invalid Nursing Codes

EID	Item5 Classification	Item18 Major CIP	Item28 Last Name	Item29 First Name	
[redacted]	Doctoral	51380500	[redacted]	JACOB	1
[redacted]	Doctoral	51380800	[redacted]	VICTORIA	1
Grand Total					2

SCH for UG Degree Program LT 100

EID	Item5 Classification	Item26 SCH UG Degree Program	Item28 Last Name	Item29 First Name	
[redacted]	Senior	95	[redacted]	NICHOLAS	1
[redacted]	Senior	0	[redacted]	TYLER	1
Grand Total					2

Blank Major CIP

EID	Item28 Last Name	Item29 First Name	Item18 Major CIP	
[redacted]		EMILY	Null	1
Grand Total				1

Using calculated fields, determine if your data has bad records before submission.

Knowing about bad records in your data will save you HOURS of waiting.

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CBM001 Error Records

Students in Doctoral Class but not Doctoral Student

EID	Item28 Last Name	Item29 First Name	Item5 Classification	
[redacted]		DANIEL	Sophomore	1
		TYLER	Senior	1
Grand Total				2

Invalid Hazlewood SSNs

EID	Student SSN	Item5 Classification	Item28 Last Name	Item29 First Name	
[redacted]		Senior	[redacted]	CHRISTIAN	1
		Doctoral		KIRSTEN	1
		Senior		RYAN	1
Grand Total					3

FTIC Seniors with Blank CEEB Code

EID	Item5 Classification	Item9 Transfer FTIC	Item36 High School Code	Item28 Last Name	Item29 First Name	
[redacted]	Senior	1	Null	[redacted]	TYLER	1
Grand Total						1

HB1403 with Unknown Ethnicity

EID	CF: Racial Category	CF: Tuition Status	Item28 Last Name	Item29 First Name	
[redacted]	I. Ethnic Origin/Race Unknown	G. Resident Tuition (HB1403)	[redacted]	JUAN	1
Grand Total					1

UG On/Off Campus SCH != UG SCH

EID	Item5 Classification	Item28 Last Name	Item29 First Name	CF: Subtotal of SCH Values	CF: Sum On/Off Campus	Distinct count of Item3 Student ID
[redacted]	Junior	[redacted]	MELISSA	13.00	23.00	1.00
	Senior		TYLER	0.00	9.00	1.00
Grand Total						2.00

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Lastly, you will be able to find any quesitonable records for which THECB will require justification statements.

CBM001 Questionable Records

Master Students with no Master Class

EID	Item28 Last Name	Item29 First Name	Item5 Classification	
[redacted]		COURTNEY	Doctoral	1
Grand Total				1

Blank First Name

EID	Item29 First Name	Item28 Last Name	
[redacted]		RITIKA	1
		SHILPA	1
Grand Total			2

Doctoral Students with no Doctoral Funding

EID	Item28 Last Name	Item29 First ..	Item5 Clas..	Sum ..	Item1..	Distin..
[redacted]		ANN	Doctoral	0.00	0.00	1.00
		ALEXANDER	Doctoral	0.00	0.00	1.00
		ANDREW	Doctoral	0.00	0.00	1.00
		ANDREA	Doctoral	0.00	0.00	1.00
		ASHLEY	Doctoral	0.00	0.00	1.00
		ALEXANDER	Doctoral	0.00	0.00	1.00
		BENJAMIN	Doctoral	0.00	0.00	1.00
		FRANK	Doctoral	0.00	0.00	1.00
		BRADLEY	Doctoral	0.00	0.00	1.00
		BENJAMIN	Doctoral	0.00	0.00	1.00
		CLIFF	Doctoral	0.00	0.00	1.00
		CHRISTOPHE	Doctoral	0.00	0.00	1.00
		COLLEEN	Doctoral	0.00	0.00	1.00
		EVAN	Doctoral	0.00	0.00	1.00
		GREG	Doctoral	0.00	0.00	1.00

UG Program Hours out of Range

EID	Item5 Cla..	Item28 Last Name	Item29 First Name	Item..	
[redacted]	Junior	[redacted]	ANNABEL	227	1
	Senior		ARIANA	161	1
	Junior		ALENA	161	1
	Senior		ALEXANDER	161	1
	Junior		ALEJANDRO	161	1
	Junior		ANA	161	1
	Junior		ALISTAIR	161	1
	Senior		ANA	161	1
	Junior		ANGELIKI	161	1
	Junior		AMANDA	162	1
	Junior		ANDREW	227	1
	Junior		ANDREE	100	1
	Senior		ALIF	166	1
	Senior		ADAM	161	1

Hazlewood for OOS Students

EID	Item28 Last Name	Item29 First Name	Item8 Reside..	
[redacted]		AARON	356	1
		JOSEPHINE	370	1
		KIRSTEN	500	1
		LIZA	340	1
Grand Total				4

Younger than 14, older than 75

EID	Item28 Last Name	Item29 First Name	CF: Correct DOB	Exact Age	
[redacted]		EWIN	4/25/2000	16	1
		NANCY	10/18/1941	75	1
		PAUL	5/2/2000	16	1
Grand Total					3

Sum of UG Hours > 22

EID	Item28 Last Name	Item29 First Name	Item5 Classification		
[redacted]		ANDREW	Senior	23.00	1.00
		ANN	Senior	23.00	1.00
		BLAKE	Senior	30.00	1.00
		DANIELLE	Senior	23.00	1.00
		HELEN	Junior	23.00	1.00
		KARTIK	Junior	23.00	1.00
		LI	Senior	23.00	1.00
		LAKSHMI	Senior	23.00	1.00

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Since we're talking CB reports, what if you could know your SUE score ahead of time?

What about a block view of room utilization?..

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Blending space info and student courses, you can build a utilization report.

Working with IQ, we built a custom data set; it was not easy!

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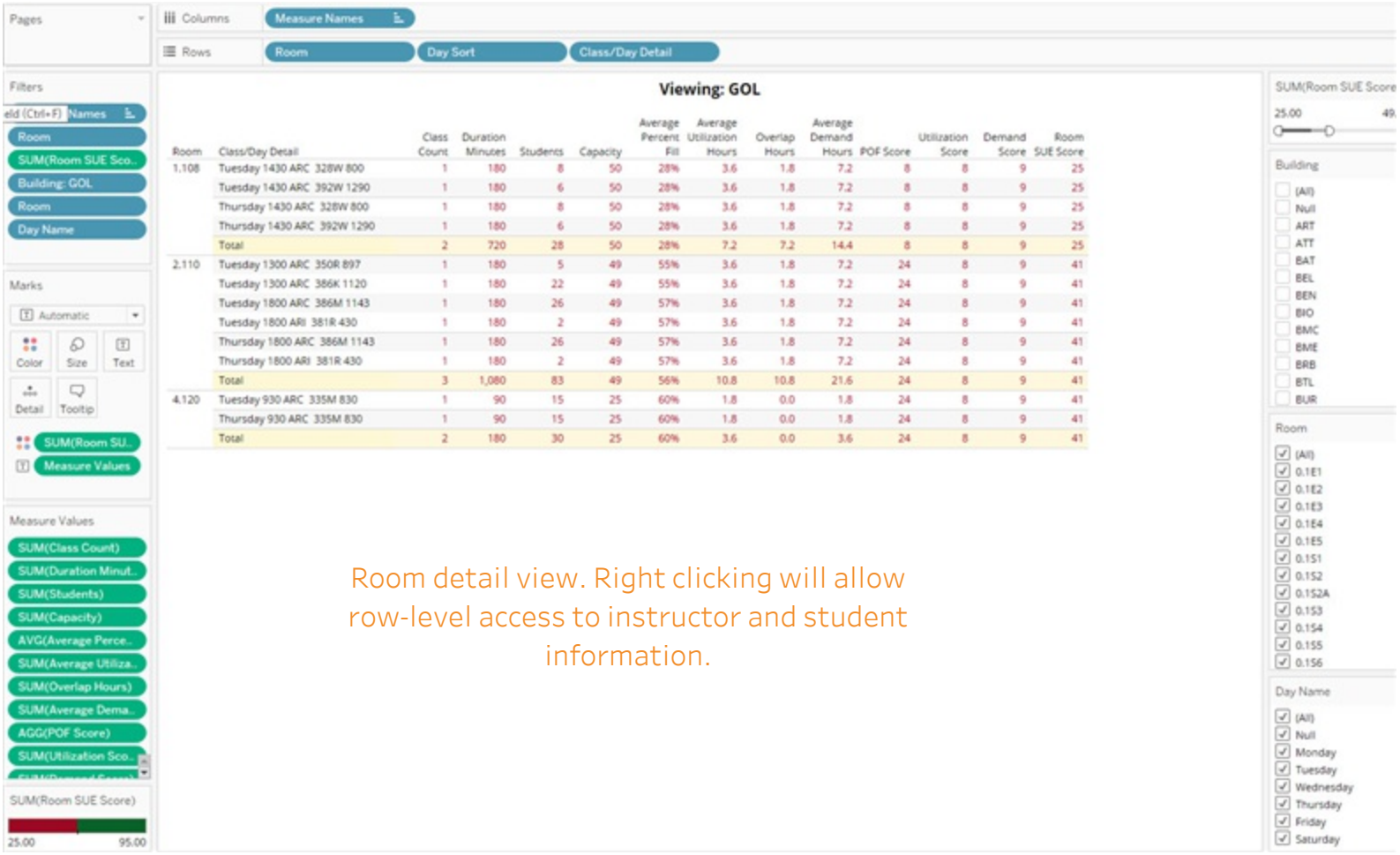
Using blended data, individual rooms can be viewed.



Room	Class/Day Detail	Class Count	Duration Minutes	Students	Capacity	Average Percent Fill	Average Utilization Hours	Overlap Hours	Average Demand Hours	POF Score	Utilization Score	Demand Score	Room SUE Score
1.108	Tuesday 1430 ARC 328W 800	1	180	8	50	28%	3.6	1.8	7.2	8	8	9	25
	Tuesday 1430 ARC 392W 1290	1	180	6	50	28%	3.6	1.8	7.2	8	8	9	25
	Thursday 1430 ARC 328W 800	1	180	8	50	28%	3.6	1.8	7.2	8	8	9	25
	Thursday 1430 ARC 392W 1290	1	180	6	50	28%	3.6	1.8	7.2	8	8	9	25
	Total	2	720	28	50	28%	7.2	7.2	14.4	8	8	9	25
2.110	Tuesday 1300 ARC 350R 897	1	180	5	49	55%	3.6	1.8	7.2	24	8	9	41
	Tuesday 1300 ARC 386K 1120	1	180	22	49	55%	3.6	1.8	7.2	24	8	9	41
	Tuesday 1800 ARC 386M 1143	1	180	26	49	57%	3.6	1.8	7.2	24	8	9	41
	Tuesday 1800 ARI 381R 430	1	180	2	49	57%	3.6	1.8	7.2	24	8	9	41
	Thursday 1800 ARC 386M 1143	1	180	26	49	57%	3.6	1.8	7.2	24	8	9	41
	Thursday 1800 ARI 381R 430	1	180	2	49	57%	3.6	1.8	7.2	24	8	9	41
	Total	3	1,080	83	49	56%	10.8	10.8	21.6	24	8	9	41
4.120	Tuesday 930 ARC 335M 830	1	90	15	25	60%	1.8	0.0	1.8	24	8	9	41
	Thursday 930 ARC 335M 830	1	90	15	25	60%	1.8	0.0	1.8	24	8	9	41
	Total	2	180	30	25	60%	3.6	0.0	3.6	24	8	9	41

Room detail view. Right clicking will allow row-level access to instructor and student information.

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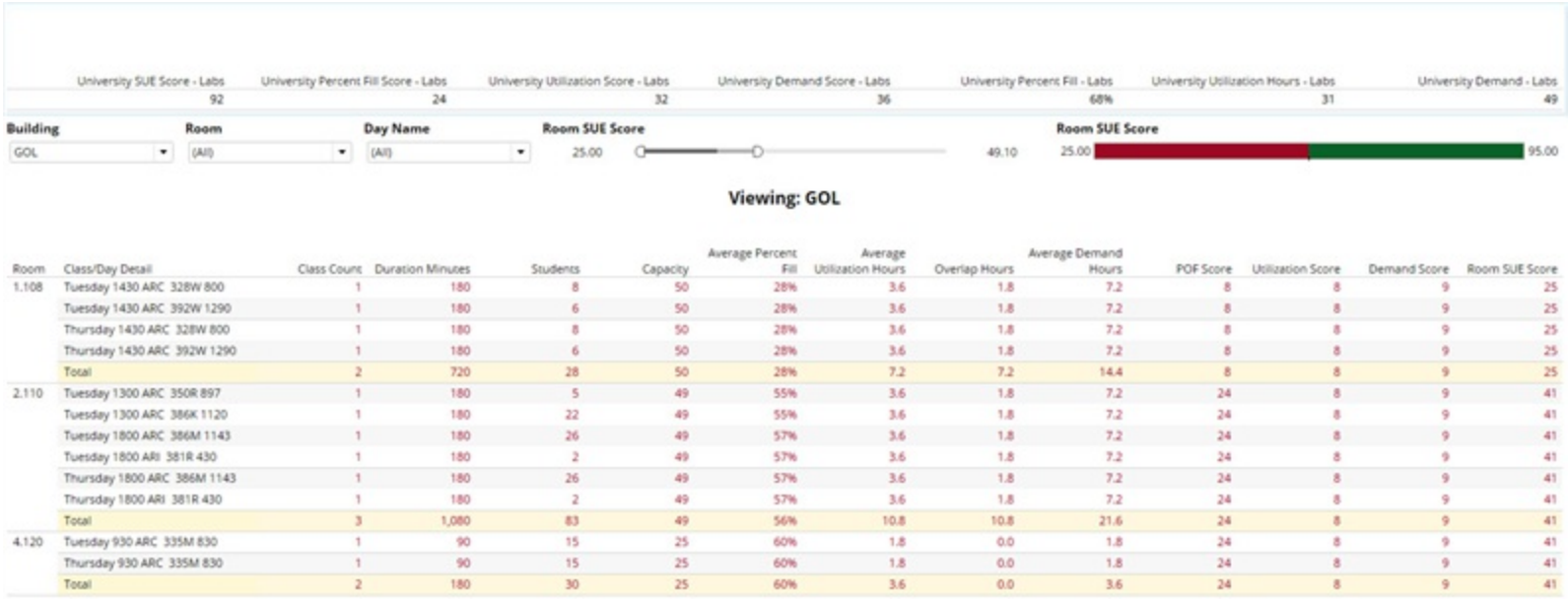
Create a dashboard with tools for user to customize view.



University SUE Score - Labs	University Percent Fill Score - Labs	University Utilization Score - Labs	University Demand Score - Labs	University Percent Fill - Labs	University Utilization Hours - Labs	University Demand - Labs
92	24	32	36	68%	31	49

Building: GOL | Room: (All) | Day Name: (All) | Room SUE Score: 25.00 – 49.10 | Room SUE Score: 25.00 – 95.00

Viewing: GOL

Room	Class/Day Detail	Class Count	Duration Minutes	Students	Capacity	Average Percent Fill	Average Utilization Hours	Overlap Hours	Average Demand Hours	POF Score	Utilization Score	Demand Score	Room SUE Score
1.108	Tuesday 1430 ARC 328W 800	1	180	8	50	28%	3.6	1.8	7.2	8	8	9	25
	Tuesday 1430 ARC 392W 1290	1	180	6	50	28%	3.6	1.8	7.2	8	8	9	25
	Thursday 1430 ARC 328W 800	1	180	8	50	28%	3.6	1.8	7.2	8	8	9	25
	Thursday 1430 ARC 392W 1290	1	180	6	50	28%	3.6	1.8	7.2	8	8	9	25
	Total	2	720	28	50	28%	7.2	7.2	14.4	8	8	9	25
2.110	Tuesday 1300 ARC 350R 897	1	180	5	49	55%	3.6	1.8	7.2	24	8	9	41
	Tuesday 1300 ARC 386K 1120	1	180	22	49	55%	3.6	1.8	7.2	24	8	9	41
	Tuesday 1800 ARC 386M 1143	1	180	26	49	57%	3.6	1.8	7.2	24	8	9	41
	Tuesday 1800 ARI 381R 430	1	180	2	49	57%	3.6	1.8	7.2	24	8	9	41
	Thursday 1800 ARC 386M 1143	1	180	26	49	57%	3.6	1.8	7.2	24	8	9	41
	Thursday 1800 ARI 381R 430	1	180	2	49	57%	3.6	1.8	7.2	24	8	9	41
	Total	3	1,080	83	49	56%	10.8	10.8	21.6	24	8	9	41
4.120	Tuesday 930 ARC 335M 830	1	90	15	25	60%	1.8	0.0	1.8	24	8	9	41
	Thursday 930 ARC 335M 830	1	90	15	25	60%	1.8	0.0	1.8	24	8	9	41
	Total	2	180	30	25	60%	3.6	0.0	3.6	24	8	9	41

This dashboard allows the user to see overall university score on top, and ability to adjust view to individual building and/or room.

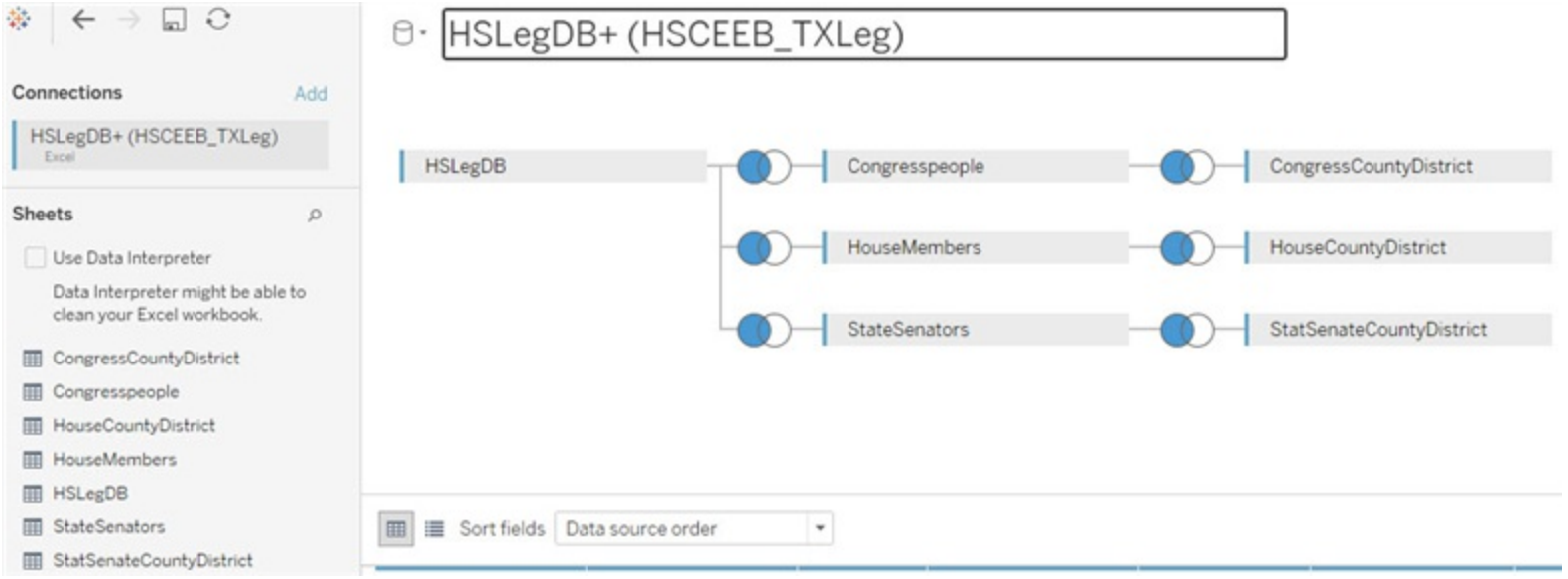
Thank you for your time!

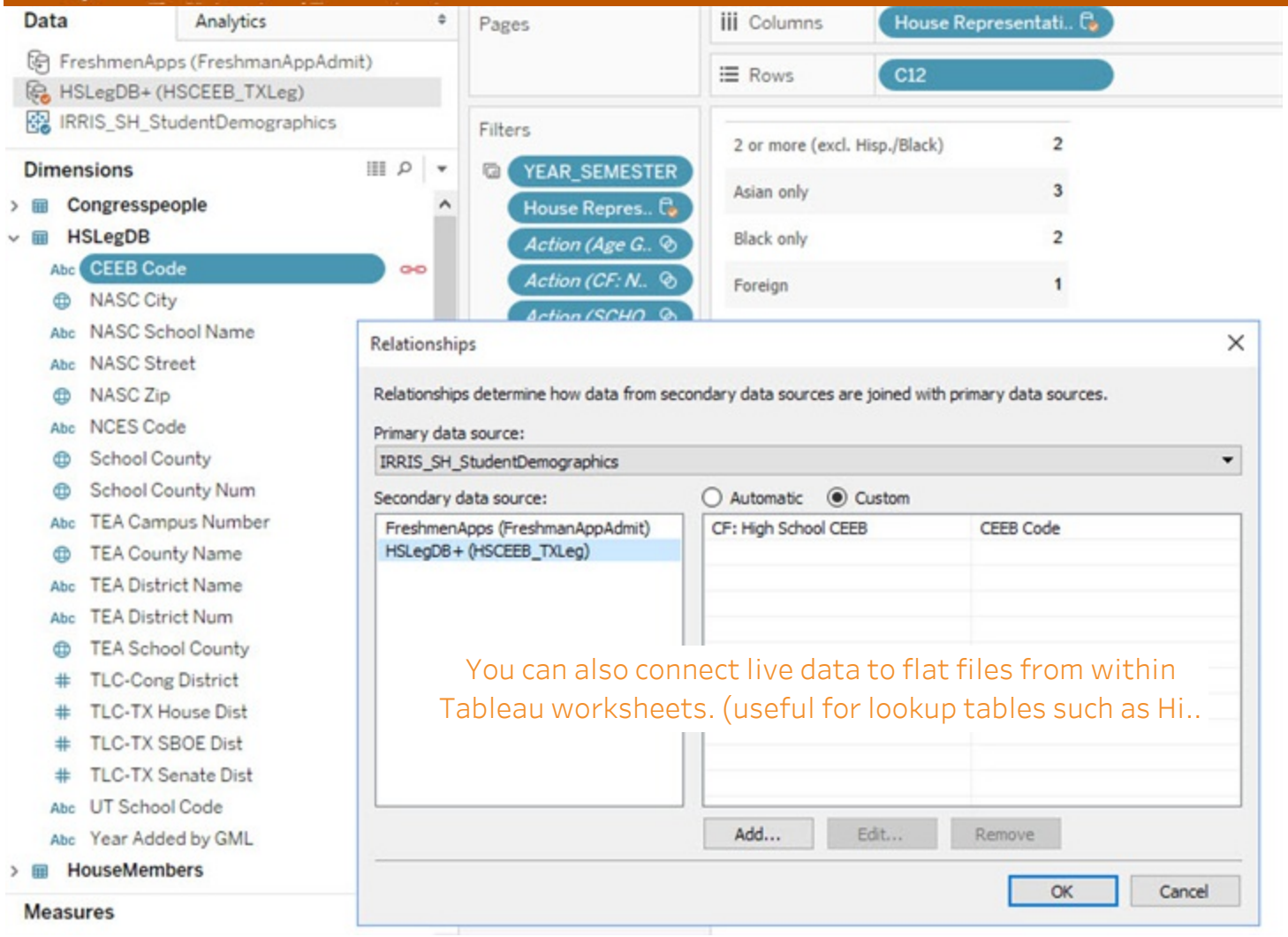
Al Walser - The University of Texas at Austin - alwalser@austin.utexas.edu

TEXAS

What does your connection look like?

Connections can be made from within an Excel workbook
by joining worksheets.





You can also connect live data to flat files from within Tableau worksheets. (useful for lookup tables such as Hi..

White only	22,227	43.3%
Hispanic (any combination)	10,265	20.0%
Black only	2,025	3.9%
Black (2 or more, excl. Hisp.)	346	0.7%
Asian only	9,155	17.8%
American Indian only	77	0.2%
Hawaiian/Pac. Islander only	67	0.1%
2 or more (excl. Hisp./Black)	1,337	2.6%
Foreign	5,167	10.1%
Unknown	665	1.3%
Total UT Austin	**51,331**	

Total and % of Total Number of Records along CF: Semester and Year, C12 broken down by CF: Semester and Year and C12. The data is filtered on YEAR_SEMESTER, which keeps 20169.