

Informing Policy Decisions Through Data Visualizations

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About Data Visualizations



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Data Visualization – Not a One-Trick Pony

- Facilitate understanding of complex information
- Allow user to interact and select specific data
- Support and inform policy-making decisions
- Evaluate the impact of policy decisions



Effective Visualizations

- Tell a story
 - Look for patterns in data. Data combined with the right tools should lead to explanations and discovery
- Make information consumable
 - Make it easier for non-programmers to manipulate/analyze data and create reports
 - Selecting the right visualization is key to making data informative, as well as understandable

Combined Impact:

Enhance transparency
and
accountability efforts



What Makes Good Visualization?

- Determining factors for picking the right visualization
 - What data do you need to convey?
 - What message do you want to communicate?
 - Which audience do you want to reach?
 - Does it offer a different way of thinking about the data?



Using Data Visualization to Inform Policy

- Use trend analysis and predictive modeling
- Communicate message to audiences of all levels
- Collaborate with other researchers, educational leaders, visualization experts, and outside agencies
- Provide benchmarks for comparison and/or progress



UT System's Data Culture



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The Evolution of Data Use

Data-Driven Decision-Making



Reporting
What?

Analyzing
Why?



Planning,
Predicting,
Improving
What Now?



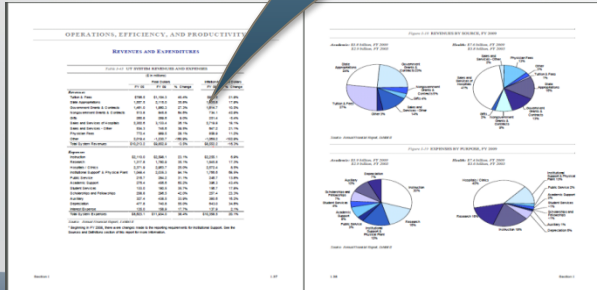
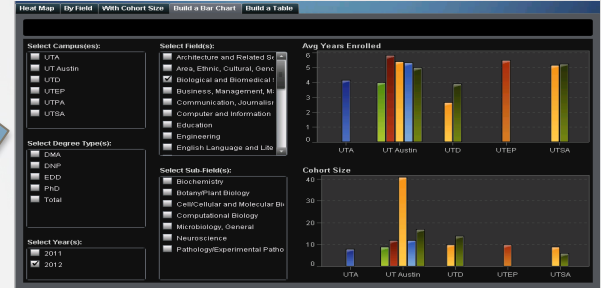
The Evolution of Data Delivery

Availability + Relevance

Printed Reports

PDFs On Web

Interactive Online Dashboard & Visualizations



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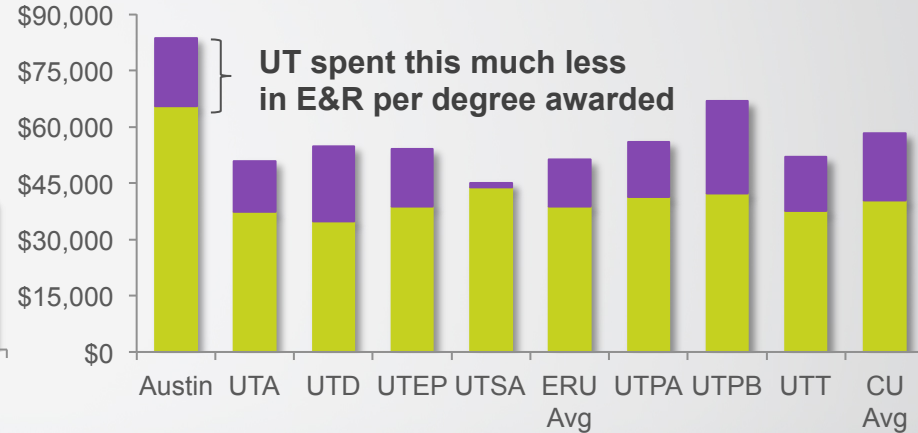
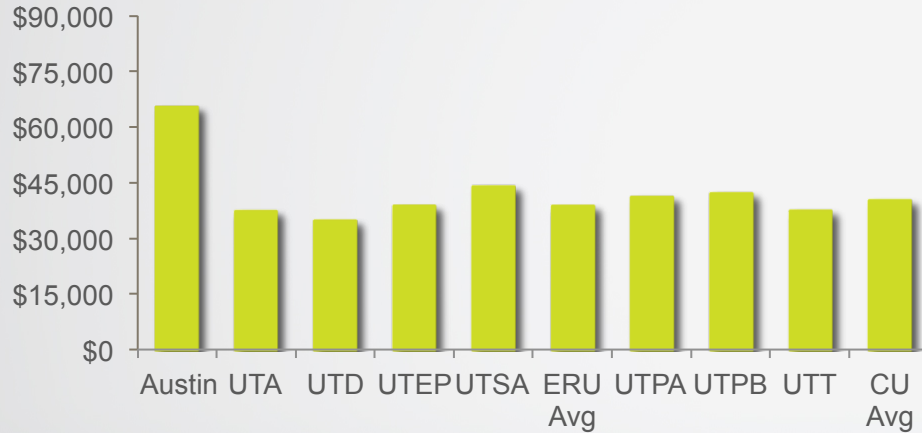
More compelling and useful visualizations will give the user what he/she wants. Visualizations are now easier to create; they help capacity *and* increase demand.

Using Data: Peer Selection, Benchmarking, & Goal-Setting

- Using Data to Select Peers
 - Baseline Peers – institutions statistically similar to you now
 - Aspirational Peers – institutions that are now what you plan to be in the long-term (10-15 years)
- Goal-Setting
 - Top quintile of baseline performers as mid-range goals (2020)
 - Long-term goals set at bottom quintile of aspirational peers (2025)
- Benchmarking is critical to evaluating institutional performance
 - Benchmark as starting point (you must know where you started so you can evaluate how far you have come)
 - Benchmark as context (performance relative to what)



Adding Peer Comparison for Context



Visualizing Peer Comparisons

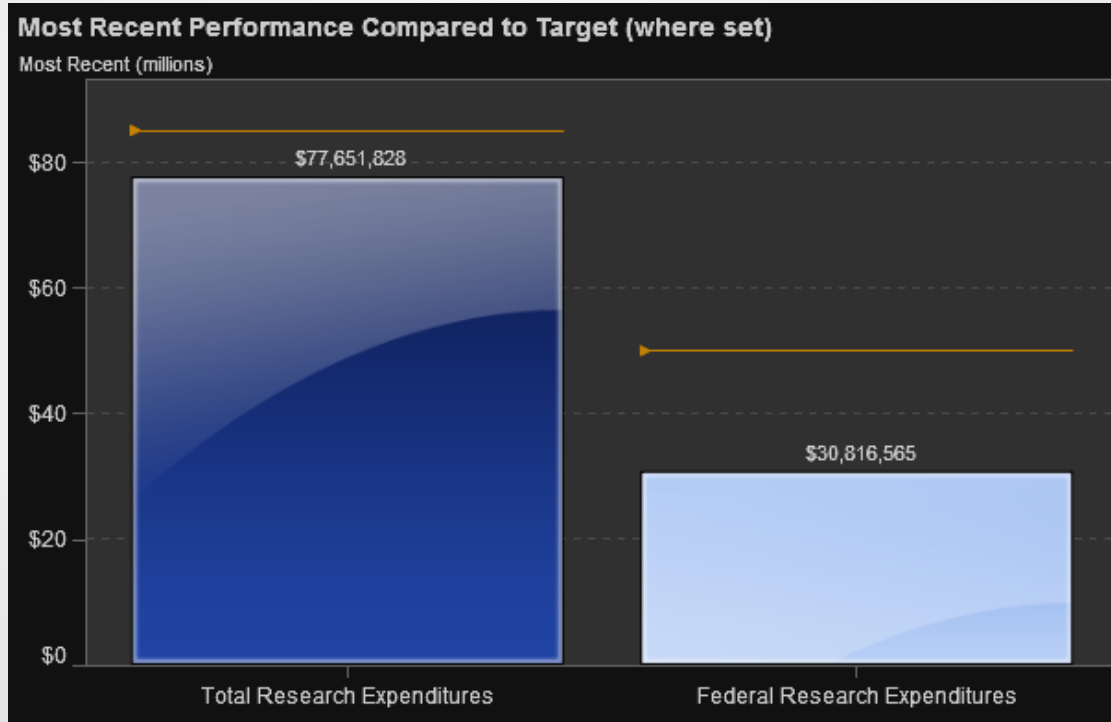
The screenshot shows the homepage of the University of Texas System website. At the top, there is a navigation menu with links for Home, About, UT Matters, Video, Document Library, Careers, Directory, Site Map, and Contact Us. Below the navigation is a blue header with the text "THE UNIVERSITY of TEXAS SYSTEM" and the tagline "Nine Universities. Six Health Institutions. Unlimited Possibilities." A search bar is located on the right side of the header. Below the header is a horizontal menu with links for News, Institutions, Leadership, Offices, Students, and Giving. The main content area features a large news article titled "Board welcomes new members and elects officers". The article text reads: "On Thursday, the UT System Board of Regents elected Paul Foster the new Chairman of the Board. Foster succeeds Gene Powell who was elected to serve as Vice Chairman along with Regent Steve Hicks. New Board members are Regent Ernest Aliseda, Regent Jeffery Hildebrand and Student Regent Nash Home. [Read more here.](#)" The article is accompanied by several photographs of the board members. To the right of the article is a sidebar with a "BOARD of REGENTS" logo and the text "The University of Texas System". Below the article is a "News" section with a list of recent news items, each with a date of August 22, 2013, except for one dated August 19, 2013. The news items include: "UT System Board of Regents welcomes new members and elects officers", "Task force on university-affiliated foundation relationships issues recommendations", "Regents approve \$14.6 billion operating budget for UT System", "UT System's action plan almost fully implemented", "Regents award \$1.6 million to outstanding faculty members", and "ADVISORY: UT System Regents to meet Aug. 21-22". To the right of the news section is a grid of six promotional tiles: "Finish@UT", "PRODUCTIVITY DASHBOARD", "2012 UPDATE FRAMEWORK ACTION PLAN", "MAKE A GIFT", and "Open Records". At the bottom of the page is a "UT Matters" section with the subtitle "HEADLINES AND HAPPENINGS FROM AROUND THE SYSTEM" and a headline "Nevarez appointed president emeritus of UT Pan American".



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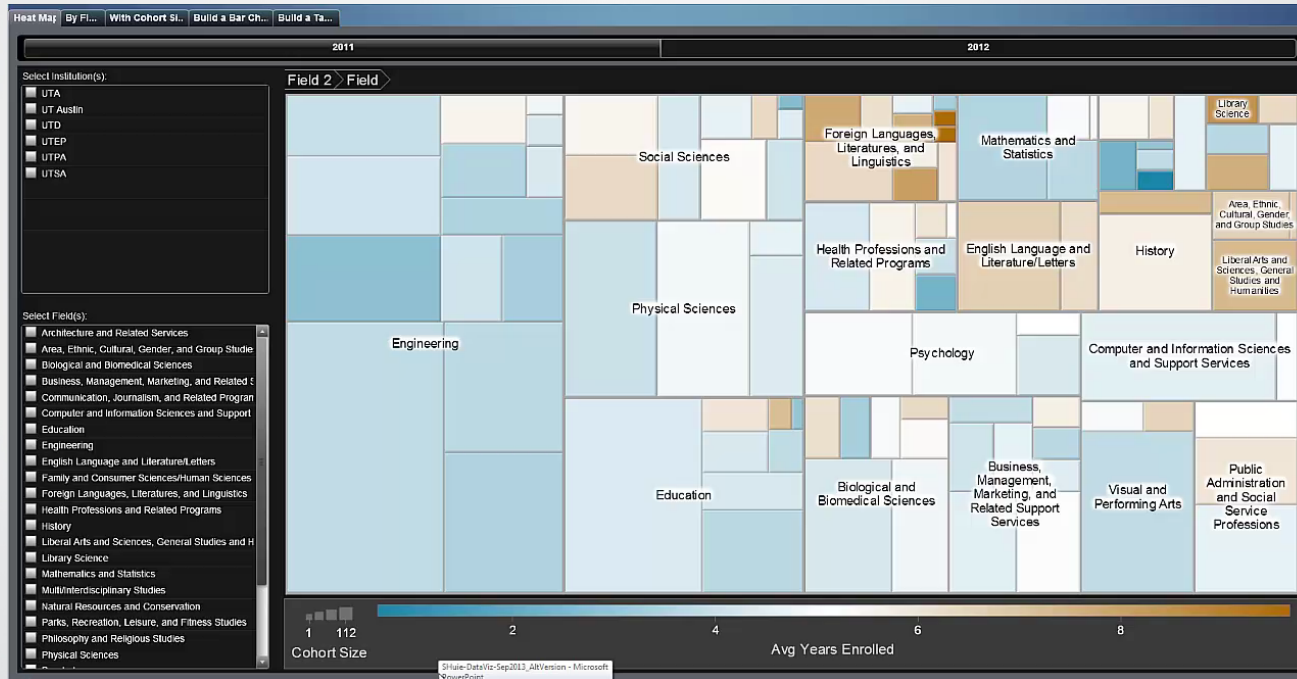
Visualizing Progress to Target



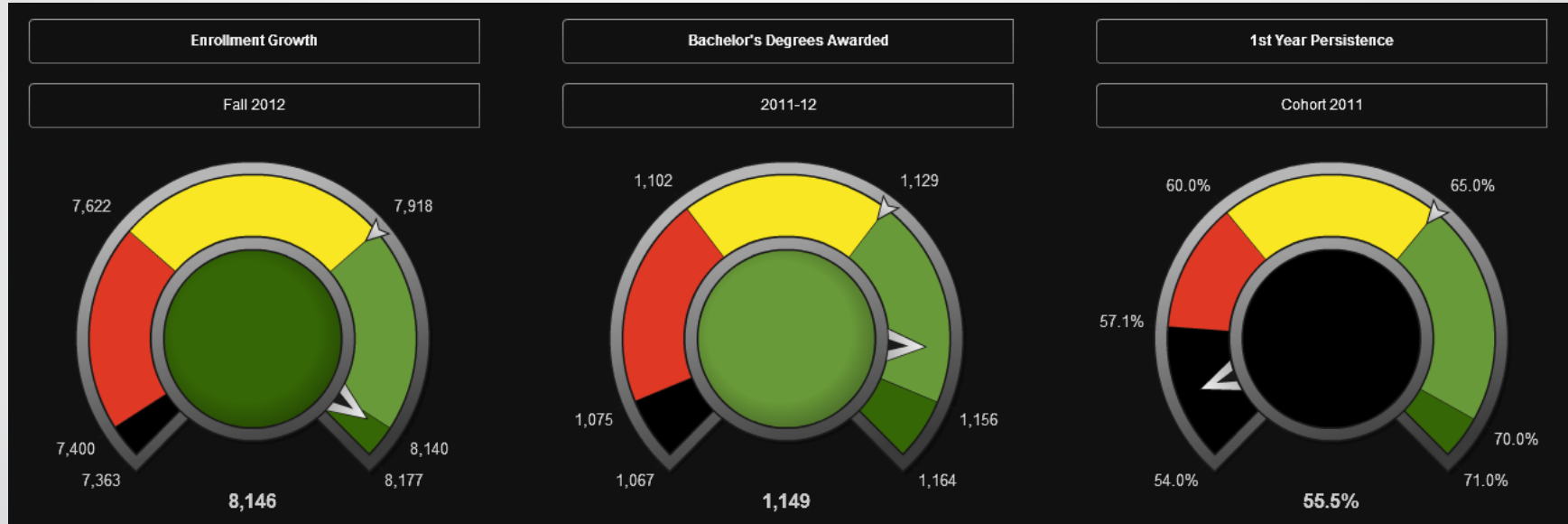
Simple Visuals Made Powerful



Treemap: A Multi-Level Indicator



Using KPIs: Internal vs External Views



Visualizations for the Business Side of Universities



Using Predictive Analytics to Inform Policy

Probability of Continuing by Predictor

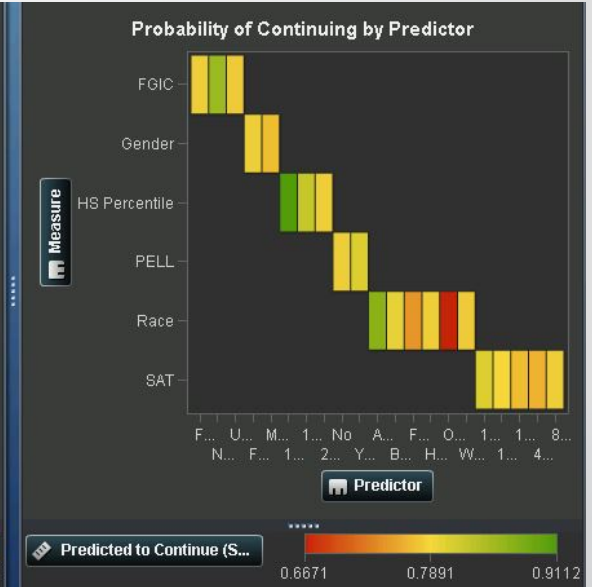
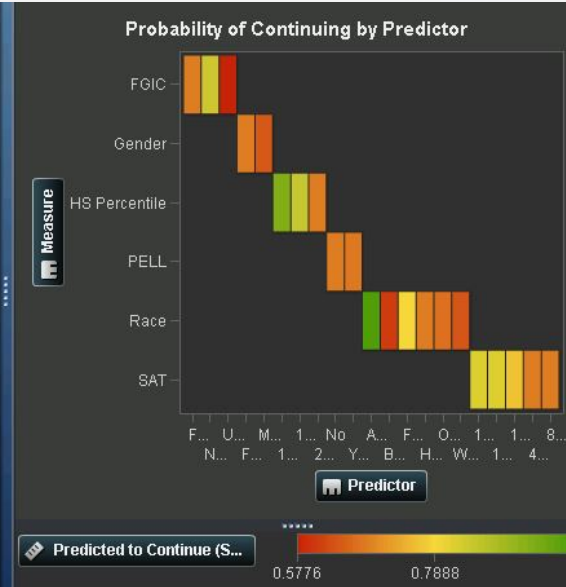
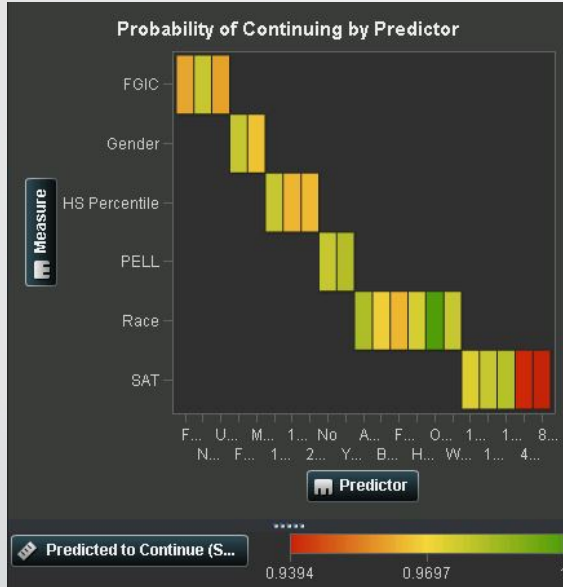


Heat Maps: Pros and Cons

Campus 1

Campus 2

Campus 3

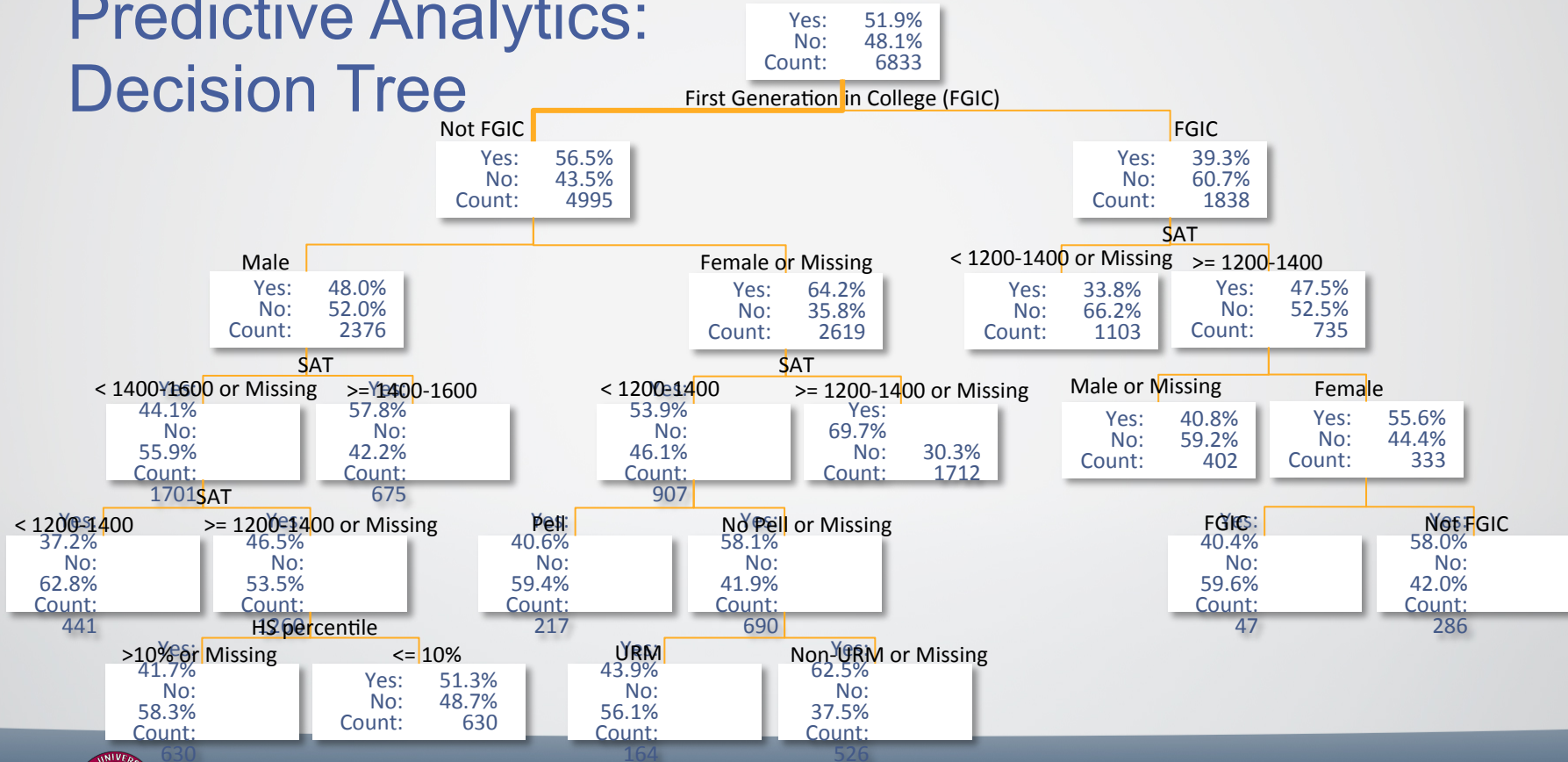


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Predictive Analytics: Decision Tree



Engaging Students Through Interactive Data Tools



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Visualizations Take Data to Other Arenas

- Develop a tool for a new and different audience
- Involve your audience in the tool creation and use feedback
- Launch interactive data tool online



The New Realm



Developing an Interactive Tool for the Student



- Follows students over time (currently five years)
- Provides earnings in the context of average loan debt, by major
- Offers ability to compare earnings and debt by various majors side-by-side
- Goes beyond the median to show distribution of earnings at the top and bottom
- Indicates the percent of students who continue their education beyond the BA
- Includes integrated view of labor market demand by occupation (BLS) – state, regional, and national





search + earnings + employment = knowledge

Home

seekUT Tool

Help

About seekUT

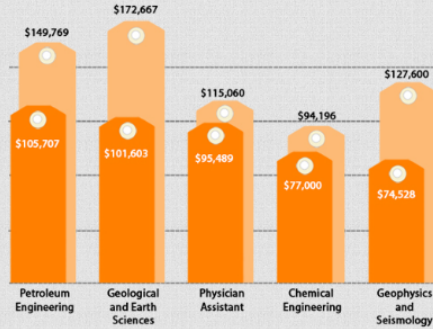
About the Data

FAQs

Resources

Top Five Salaries for UT System Graduates with Bachelor's Degrees in STEM Field of Study

Starting Salary
Salary After 5 Years



seekUT NOW



Launch the SAS® Mobile BI iPad App and connect to UT System Data

How seekUT Can Help



It can be hard to predict exactly how the choices you make today can impact your future. The UT

System's new data tool [seekUT](#) can help you. It can't predict the future. But it can tell you what the loan amounts and earnings of past UT graduates have been and help you make the decisions about your education that are right for you and your family.

seekUT NOW



Launch the SAS® Mobile BI iPad App and connect to UT System Data

Using the App



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How much did UT students graduating with a bachelor's degree earn in Texas? How much did they owe in student loans?

1. I am interested in:

Business, Management, Marketing, And Related Support Services

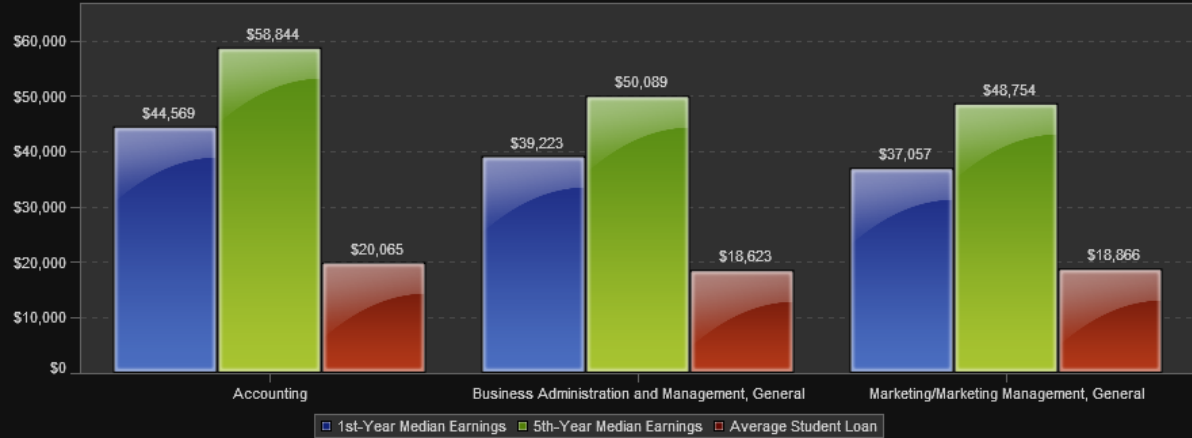
2. I am interested in attending:

- UT Arlington, UT Dallas, UT El Paso, UT San Antonio
- UT Austin
- UT Brownsville, UT Pan American, UT Permian Basin, UT Tyler

3. In my area of interest, I might want to major in:

- Accounting
- Actuarial Science
- Banking and Financial Support Services
- Business Administration and Management, General
- Business/Commerce, General
- Business/Managerial Economics
- Entrepreneurship/Entrepreneurial Studies
- Finance, General
- Human Resources Management/Personnel Administration, General
- International Business/Trade/Commerce
- Management Information Systems, General
- Management Science
- Marketing/Marketing Management, General
- Operations Management and Supervision
- Real Estate
- Sales Distribution and Marketing Operations, General

1st-Year and 5th-Year Median Earnings with Average Student Loan



Program Description, Median 1st-Year Earnings, Median 5th-Year Earnings and Average Student Loan Debt

Degree Major	Description	1st-Year Median Earnings	5th-Year Median Earnings	Average Student Loan
Accounting	A program that prepares individuals to practice the profession of accounting and to perform related business functions. Includes instruction in accounting principles and theory, financial accounting, managerial accounting, cost accounting, budget control, tax accounting, legal aspects of accounting, auditing, reporting procedures, statement analysis, planning and consulting, business information systems, accounting research methods, professional standards and ethics, and applications to specific for-profit, public, and non-profit organizations.	\$44,569	\$58,844	\$20,065
Business Administration and	A program that generally prepares individuals to plan, organize, direct, and control the functions and processes of a firm or organization.	\$39,223	\$50,089	\$18,623

Tool tip: select an object and maximize it to get a better view.

1. I am interested in:

Business, Management, Marketing, And Related Support Services

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- International Business/Trade/Commerce
- Management Information Systems, General
- Management Science
- Marketing/Marketing Management, General
- Operations Management and Supervision
- Real Estate
- Sales, Distribution, and Marketing Operations, General

What Does the Student Do?

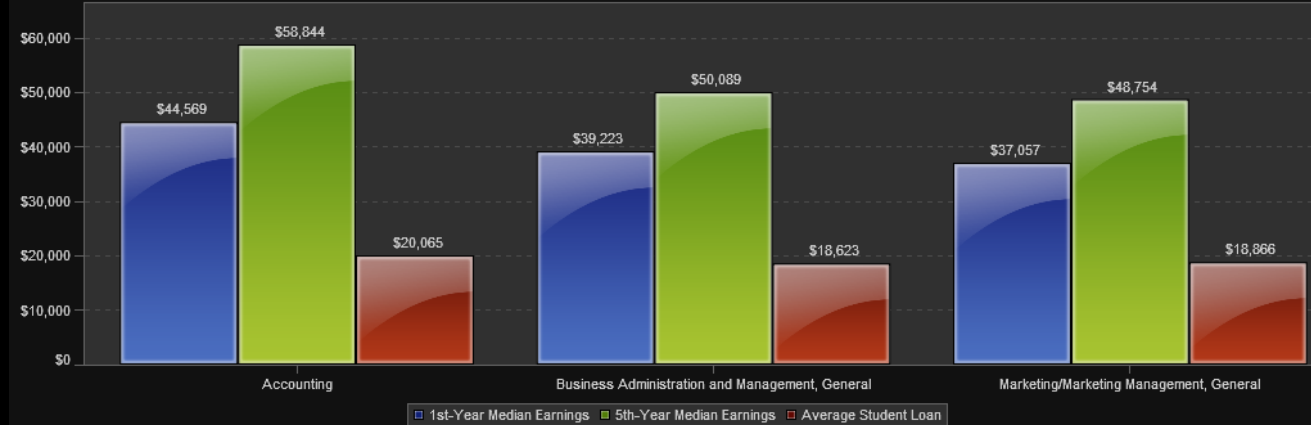
- Step Yes Selects a broad field → *Business*
- Step 2: Selects institution → *UT Arlington, UT Dallas, UT El Paso, UT San Antonio*
- Step 3: Selects specific degree majors to narrow the focus (optional) →
Accounting
Business Administration
Marketing

What Does the Report Show?

Chart

- 1st-year median earnings (blue)
- 5th-year median earnings (green)
- Average student loan debt (red)

1st-Year and 5th-Year Median Earnings with Average Student Loan



Program Description, Median 1st-Year Earnings, Median 5th-Year Earnings and Average Student Loan Debt

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Business Administration and Management, General	A program that generally prepares individuals to plan, organize, direct, and control the functions and processes of a firm or organization. Includes instruction in management theory, human resources management and behavior, accounting and other quantitative methods, purchasing and logistics, organization and production, marketing, and business decision-making.	\$39,223	\$50,089	\$18,623
Marketing/Marketing Management, General	A program that generally prepares individuals to undertake and manage the process of developing consumer audiences and moving products from	\$37,057	\$48,754	\$18,866

Table provides another view of the data and adds helpful descriptions

Drop controls here to create a section prompt

How much did the earnings of UT graduates in Texas vary within a major?

1. I am interested in:

Business, Management, Marketing, And Related Support Services

2. I am interested in attending:

- UT Arlington, UT Dallas, UT El Paso, UT San Antonio
- UT Austin
- UT Brownsville, UT Pan American, UT Permian Basin, UT Tyler

3. In my area of interest, I might want to major in:

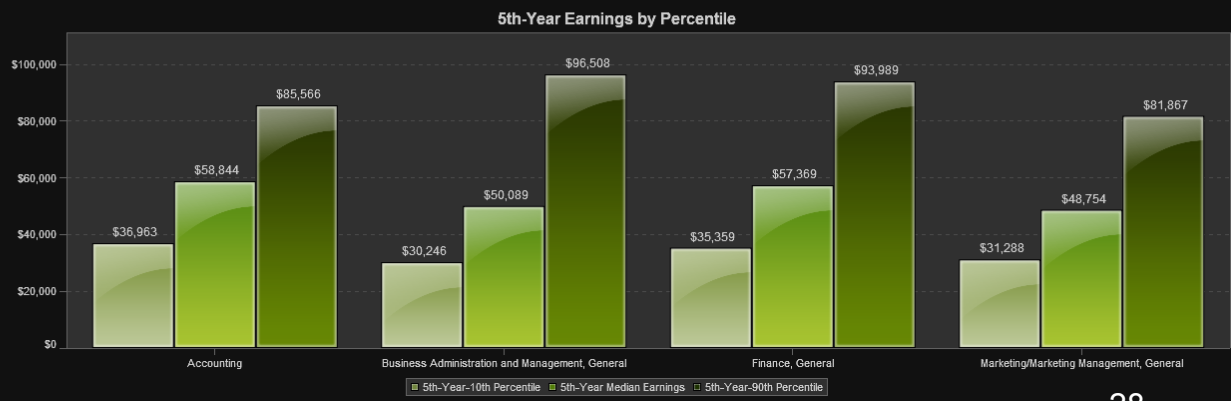
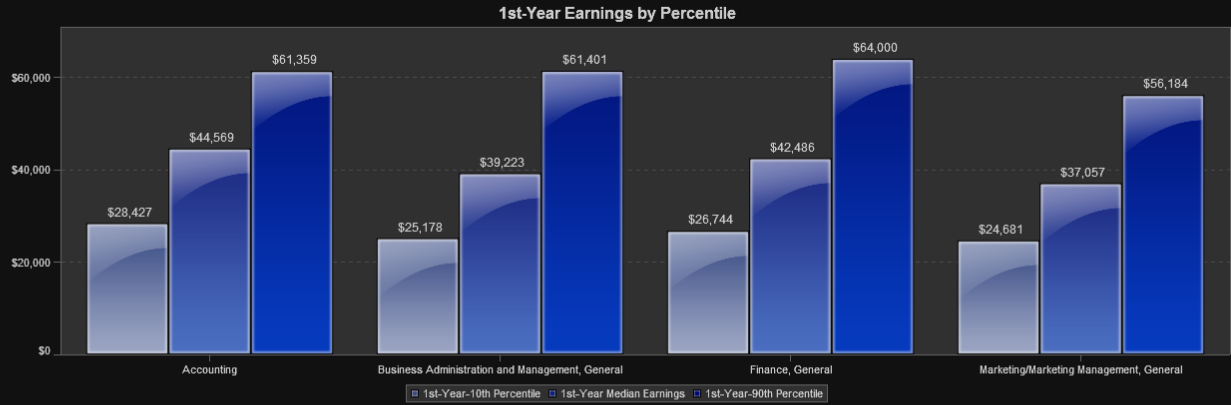
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- Finance, General
- Human Resources Management/Personnel Administration, General
- International Business/Trade/Commerce
- Management Information Systems, General
- Management Science
- Marketing/Marketing Management, General
- Operations Management and Supervision
- Real Estate
- Sales, Distribution, and Marketing Operations, General
- Tourism and Travel Services Management

What do the percentiles mean?

10th percentile - these had earnings at the lower end. 10% had earnings less than this; 90% had higher earnings

Median - this is the 50th percentile - 50% had earnings less than this; 50% had higher earnings

90th percentile - these had earnings at the higher end. 90% had earnings less than this; only 10% had higher earnings



Drop controls here to create a section prompt

Which jobs in Texas will have the most growth? What do people working in those jobs in Texas earn?

1. I am interested in

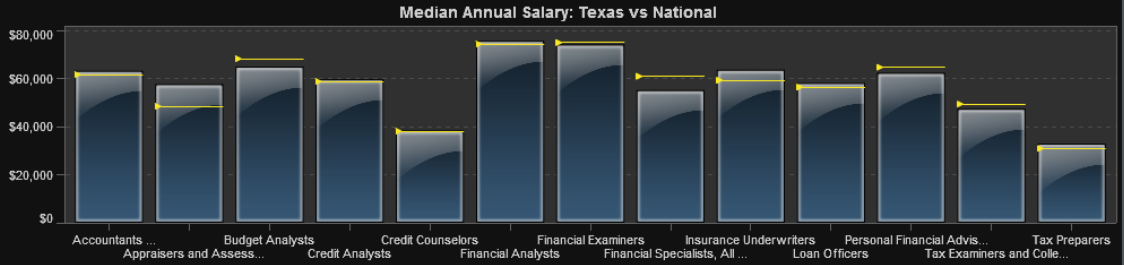
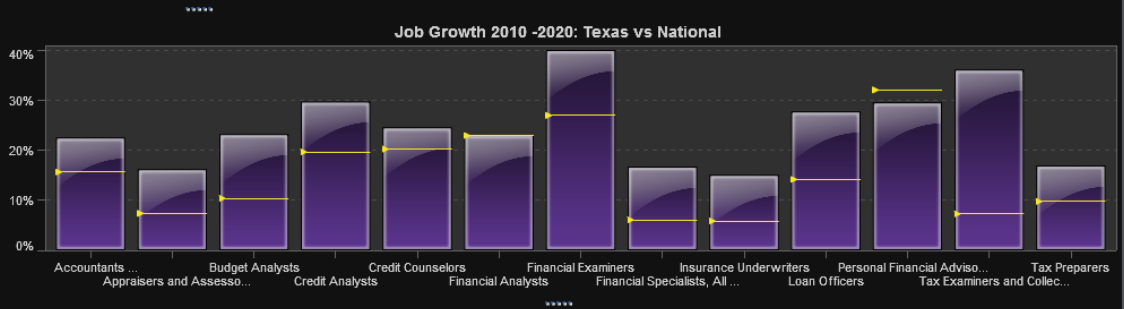
Business and Financial Operations Occupations

2. I would like to find out more about

- (missing values)
- All Business and Financial Operations Occupations
- Business Operations
- Financial Specialists

Filter on Education Requirements

Typical Education Requirements



Occupations Outlook for Texas (Statewide)

Occupation Title	Texas Median Annual Wage	TX Jobs 2010	TX Jobs 2020	Texas Job Growth	National Job Growth	Typical Education Requirements
Accountants and Auditors	\$63,180	90,480	110,950	22.6%	15.7%	Bachelor's degree
Appraisers and Assessors of Real Estate	\$57,650	6,390	7,430	16.3%	7.4%	High school diploma or equivalent
Budget Analysts	\$64,930	4,120	5,080	23.3%	10.4%	Bachelor's degree
Credit Analysts	\$59,650	4,770	6,190	29.8%	19.7%	Bachelor's degree
Credit Counselors	\$38,300	4,060	5,060	24.6%	20.3%	Bachelor's degree
Financial Analysts	\$75,000	22,440	27,440	22.3%	22.0%	Bachelor's degree
Financial Examiners	\$75,000	27,000	38,000	38.0%	27.0%	Bachelor's degree
Financial Specialists, All Other	\$55,000	7,400	7,400	7.4%	7.4%	Bachelor's degree
Insurance Underwriters	\$60,000	10,400	10,400	10.4%	10.4%	Bachelor's degree
Loan Officers	\$55,000	27,000	27,000	27.0%	27.0%	Bachelor's degree
Personal Financial Advisors	\$65,000	29,800	29,800	29.8%	29.8%	Bachelor's degree
Tax Examiners and Collectors	\$48,000	29,800	33,000	29.8%	29.8%	Bachelor's degree
Tax Preparers	\$30,000	10,400	10,400	10.4%	10.4%	High school diploma or equivalent

Drop controls here to create a section prompt

Which Texas regions will see the most job growth by occupation?

I'm interested in this region of Texas

Dallas

I'm interested in

Business and Financial Operations Occupations

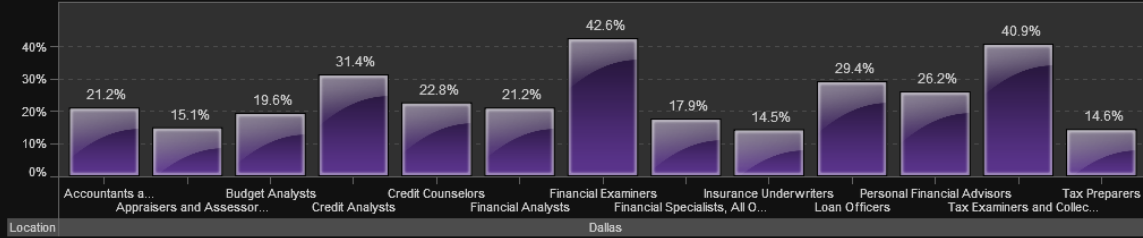
I'd like to find out more about

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- Financial Specialists

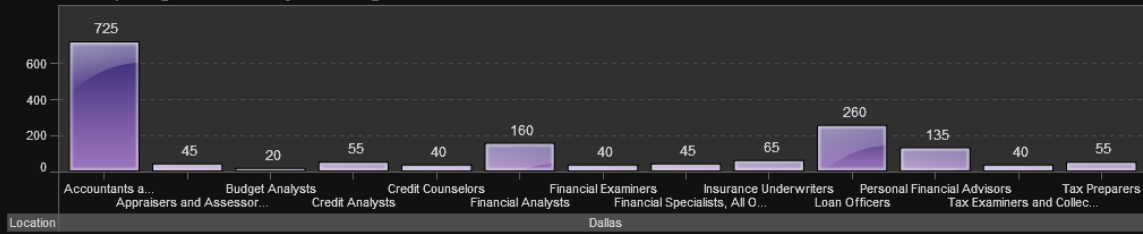
Filter on Education Requirements

Typical Education Required

Job Growth, 2010-2020, by Texas Region



Annual Job Openings, 2010-2020, by Texas Region



Occupation Outlook in Texas Regions

Occupation Title	Est Annual Job Openings..	Jobs in 2010	Jobs in 2020	Job Growth..	Typical Education Required	Location
Accountants and Auditors	725	16,900	20,480	21.2%	Bachelor's degree	Dallas
Appraisers and Assessors of Real Estate	45	1,190	1,370	15.1%	High school diploma or equivalent	Dallas
Budget Analysts	20	510	610	19.6%	Bachelor's degree	Dallas
Credit Analysts	55	1,050	1,380	31.4%	Bachelor's degree	Dallas
Credit Counselors	40	790	970	22.8%	Bachelor's degree	Dallas
Financial Analysts	160	2,730	4,570	21.2%	Bachelor's degree	Dallas

Drop controls here to create a section prompt

What do people earn in other states?

I'm interested in this state:

Florida

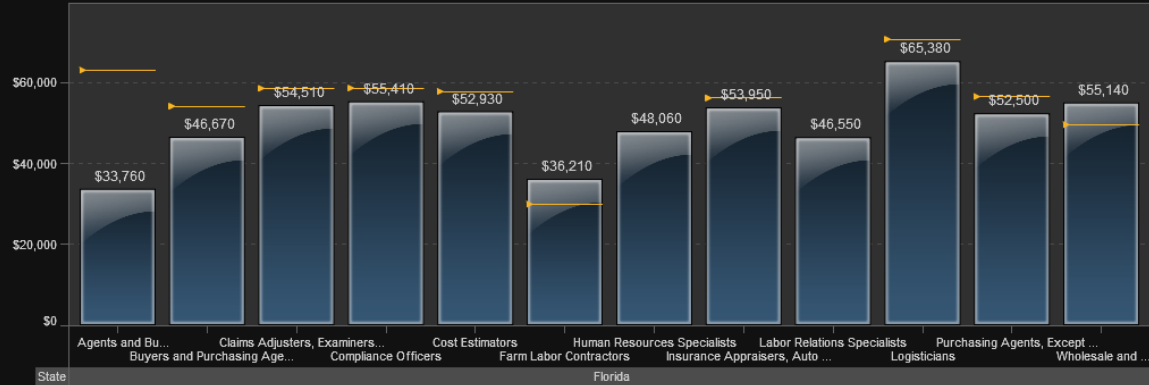
I'm interested in this Major Occupation Group:

Business and Financial Operations Occupations

I'd like to find out more about:

- (missing values)
- All Business and Financial Operations Occupations
- Business Operations
- Financial Specialists

Annual Median Wage: State vs National



Occupational Outlook - State vs National

State		Florida						
Major Occupational Group		Business and Financial Operations Occupations						
Occupation Cat...	Occupation Title	Annual Wage, 10th Percentile	Annual Wage, Median	Annual Wage, 90th Percentile	Est Total Employment in the Occupation in the State	Jobs In State vs Out of State	National Median	National Job Growth
Business Operations	Agents and Business Managers of Artists, Performers, and Athletes	\$21,540	\$33,760	\$87,490	1,010	1.53	\$63,130	14.0%
	Buyers and Purchasing Agents, Farm Products	\$35,560	\$46,670	\$76,610	300	0.52	\$54,220	5.5%
	Claims Adjusters, Examiners, and Investigators	\$35,060	\$54,510	\$84,850	20,360	1.39	\$58,620	3.0%

Using Data: Best Practices

- Be Data Smart
 - Data is just data
 - Research and analysis transform the data into information
 - Visualization and presentation make that information consumable
- Beware Data Marketing
 - Data should tell a story, but only in the sense that the visualizations presented should accurately reflect underlying patterns
 - Not all data consumers are data savvy
 - Use good data practices and be consistent



Cultivating UT's Data Culture: Lessons Learned

- Start small
- Change is hard. Expect resistance
- Demonstrate success and value and build on that.
- Give them what they want – but show them what's possible
- Make the hard sell
 - And then do it again
 - And again





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Productivity Dashboard data.utsystem.edu

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