

Decision Support: Pursuing Institutional Effectiveness

From Business Analytics to Business Intelligence

September 12, 2012

Agenda

Welcome and Introduction

Steve Swant

Georgia Institute of Technology

Decision Support at Georgia Tech

Amir Rahnamay-Azar

Georgia Institute of Technology

The Evolving University:

Disruptive Change and Institutional Innovation

Richard A. DeMillo

Georgia Institute of Technology

Best Practice Perspectives:

Development and Evolution of Decision Support

Holly Nielsen

University of Michigan

Aaron Walz

University of Illinois

The Art and Science of Communicating Data:

Information Design + Data Visualization Trends
and Practices

Holly Goodson

Georgia Health Sciences University

Envisioning and Developing a Decision
Support Function

Chet Warzynski

Georgia Institute of Technology

Kevin Center

Georgia Institute of Technology

Group Feedback

Wrap-Up and Adjournment

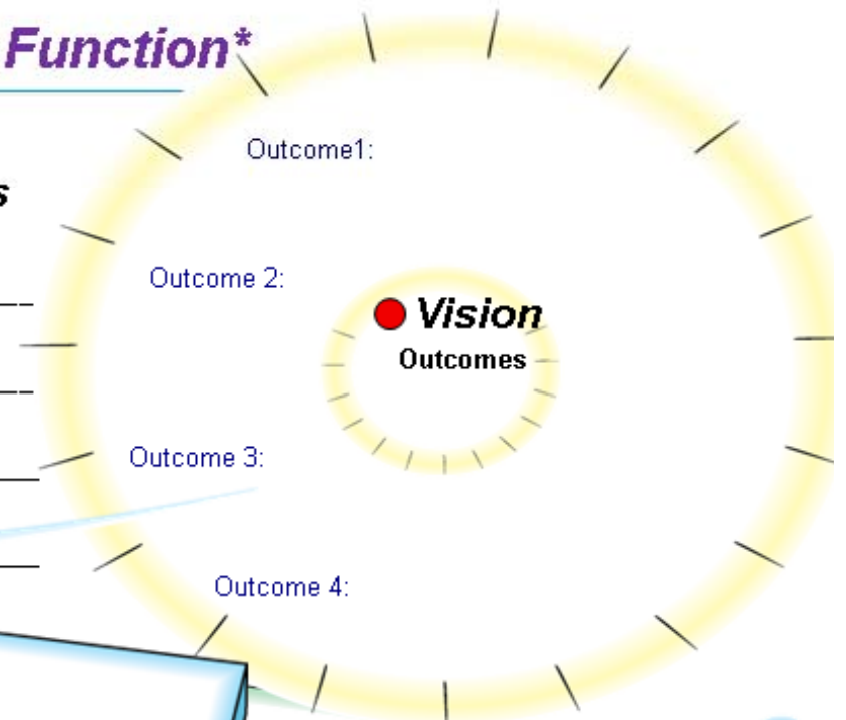
Exercise: Designing a Decision Support Function*

● Mission

Central Purpose of Decision Support:

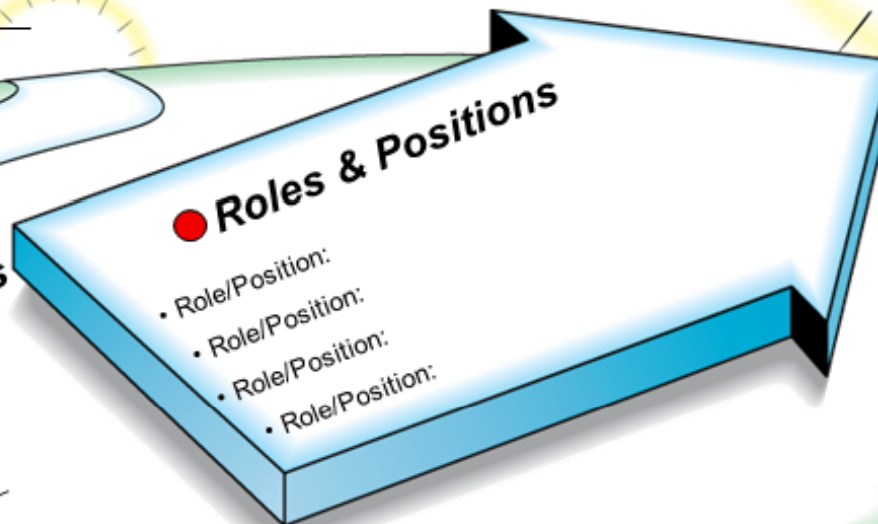
● Values/Operating Principles

- Value/Principle: _____
- Value/Principle: _____
- Value/Principle: _____
- Value Principle: _____



● Core Competencies

1. _____
2. _____
3. _____
4. _____
5. _____



● Prerequisites for Success

1. _____
2. _____
3. _____

● Metrics

1. _____
2. _____
3. _____
4. _____
5. _____

● Decision Support Studies

1. _____
2. _____
3. _____

*Adapted from *The Journey*, San Francisco: The Grove Consultants International.

WELCOME AND INTRODUCTION

Steve Swant

Executive Vice President
Administration and Finance
Georgia Institute of Technology



DECISION SUPPORT AT GEORGIA TECH

Amir Rahnamay-Azar

Senior Vice President for Administration and Finance

Georgia Institute of Technology

Current State of Business Analytics*

- 1. Business Analytics is still in the “emerging stage.”**
- 2. Organizations are proceeding cautiously in their adoption of analytics.**
- 3. Most institutions are looking to analytics to solve big issues, with the primary focus on money.**
- 4. Most institutions continue to struggle with data accuracy, consistency, and even access.**
- 5. Culture plays a critical role in the effective use of business analytics.**

*Citation for work:
Analytics in Higher Education, EDUCAUSE Center
For Applied Research, Bichsel, Jacqueline, Aug 2012

THE EVOLVING UNIVERSITY: DISRUPTIVE CHANGE AND INSTITUTIONAL INNOVATION

Richard A. DeMillo

Director, Center for 21st Century Universities and
Distinguished Professor of Computing and Management
Georgia Institute of Technology



DISCUSSION QUESTION

What impending challenges in higher education stand out as most important for decision support?

10
minutes

BEST PRACTICE PERSPECTIVES:

DEVELOPMENT AND EVOLUTION OF
DECISION SUPPORT

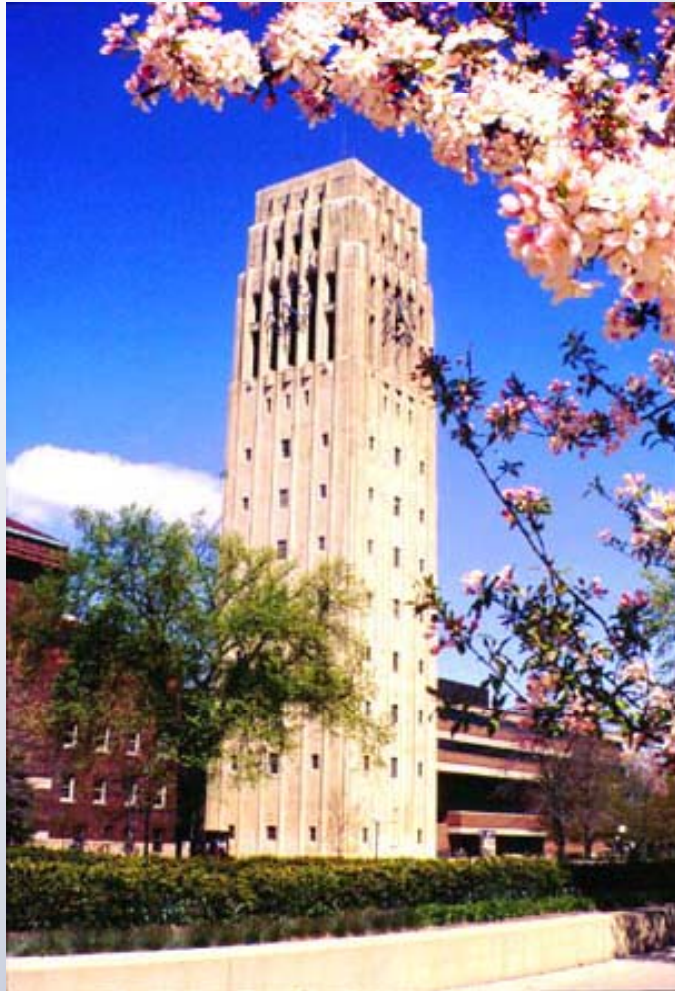
Holly Nielsen

Interim Executive Director for Application and Information Services
University of Michigan

Business Intelligence at the University of Michigan

Holly Nielsen
Interim Executive Director
Application and Information Services
hnielsen@umich.edu

The University of Michigan



- Founded in 1817
- Three campuses
 - Ann Arbor: 20 schools & colleges, University Hospitals, and Health Centers
 - Dearborn: 4 schools & colleges
 - Flint: 4 schools & colleges
- Research & Educational Units
 - 35 Centers
 - 18 Institutes
 - FY11 Research Exp. \$1.2B

University Profile (Fall 2011)

- Student Enrollment
 - Ann Arbor: 42,716
 - All Campuses: 59,933
- Regular Faculty
 - All Campuses: 6,941
- Staff & Supplemental Faculty
 - All Campuses: 35,360



Assessment and Recommendations 2006

- Build awareness via BI Community
- User segmentation; increase ‘market’
 - Power (~3000), operational (8000), casual/guided analysis (>10,000)
- Increase tools portfolio, infrastructure
 - Browser-based solutions for execs and managers
- Improve data structures
 - Aggregate, derive: add OLAP dimensional models
- Incorporated into Administrative Systems Strategic Plan

Reporting Gateways



Operational Users ← Information from Operational System →



Decision Support Users ← Guided Analysis →



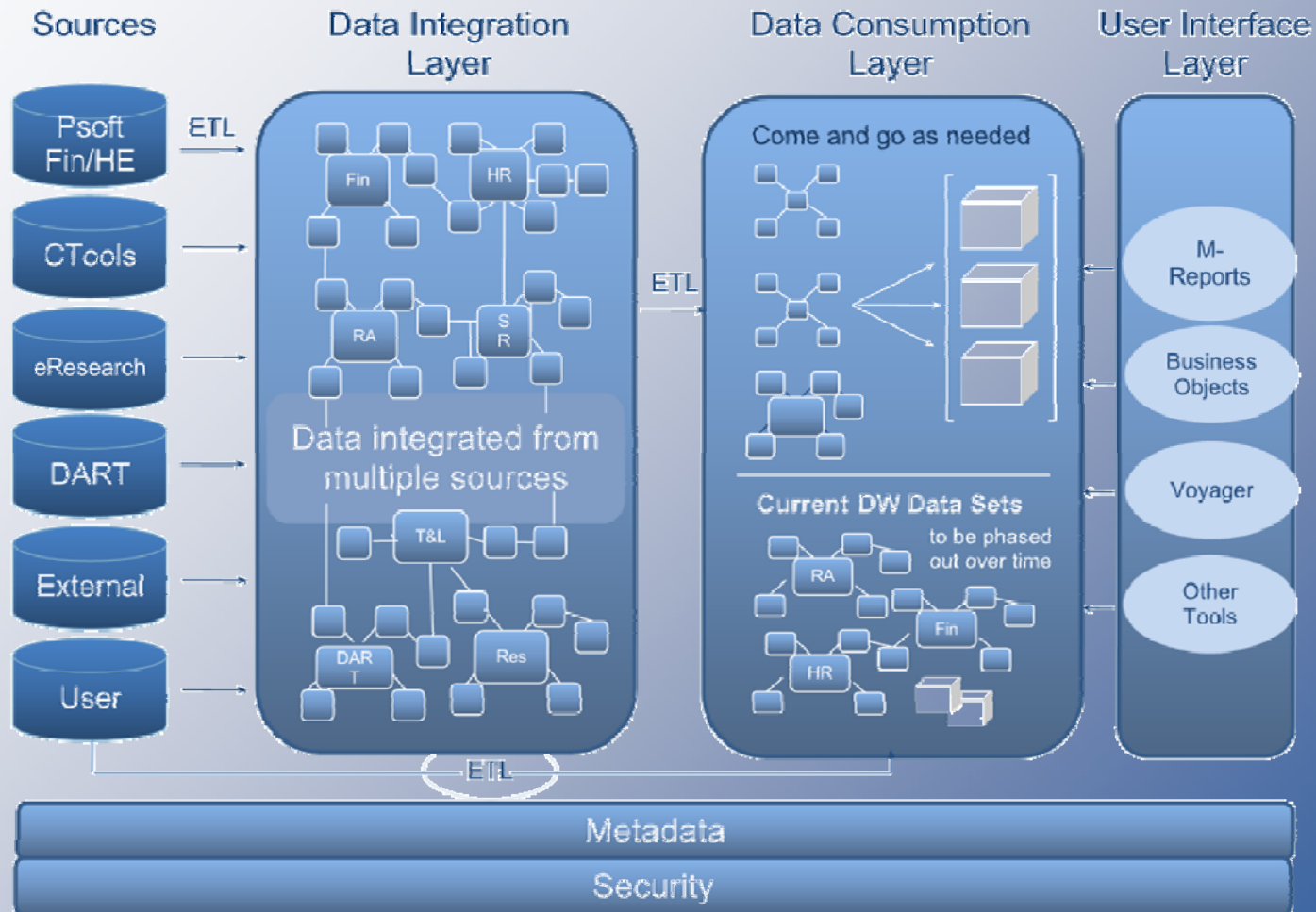
Power Users ← Direct Access / Power Tools →



Progress 2007-2012

- Increase Awareness; Educate
 - BI/Analytics Community of Experts: Events, Small Groups, BI Career Resources, BI Awards
- ITS makes parallel progress while campus readiness improves
 - BI Organization within ITS
 - Site License for Business Objects
 - M-Reports
 - Primarily Financial content; some Student Administration content
 - Ability for Dashboards, predictive analysis, alerts
 - Report Library covering FIN, HR and SA production reports and all UM DW reports
 - Data Improvement
 - Process Improvements
 - 3 Tiered Data Warehouse Architecture

Next Generation DW Architecture



Application—M-Reports

M-REPORTS UNIVERSITY OF MICHIGAN cstellre | Sign out | Contact Us | Help

MY M-REPORTS FIN. MGMT SPACE

Source/Use

- Source/Use At-A-Glance
- Source/Use Year-To-Date
- Source/Use Projections

Source/Use At-A-Glance

MY CRITERIA: [save criteria](#) [reset criteria to default](#)

Campus: Univ Of Mich Ann Arbor

School/College/Dept Group: Information & Technology Svcs

VP Area: Executive VP Chief Fin Officer

Dept: Sample Department

Through Accounting Period: Dec 2009

Fund/Group: Operating

1 of 1 100% Find | Next Select a format Export

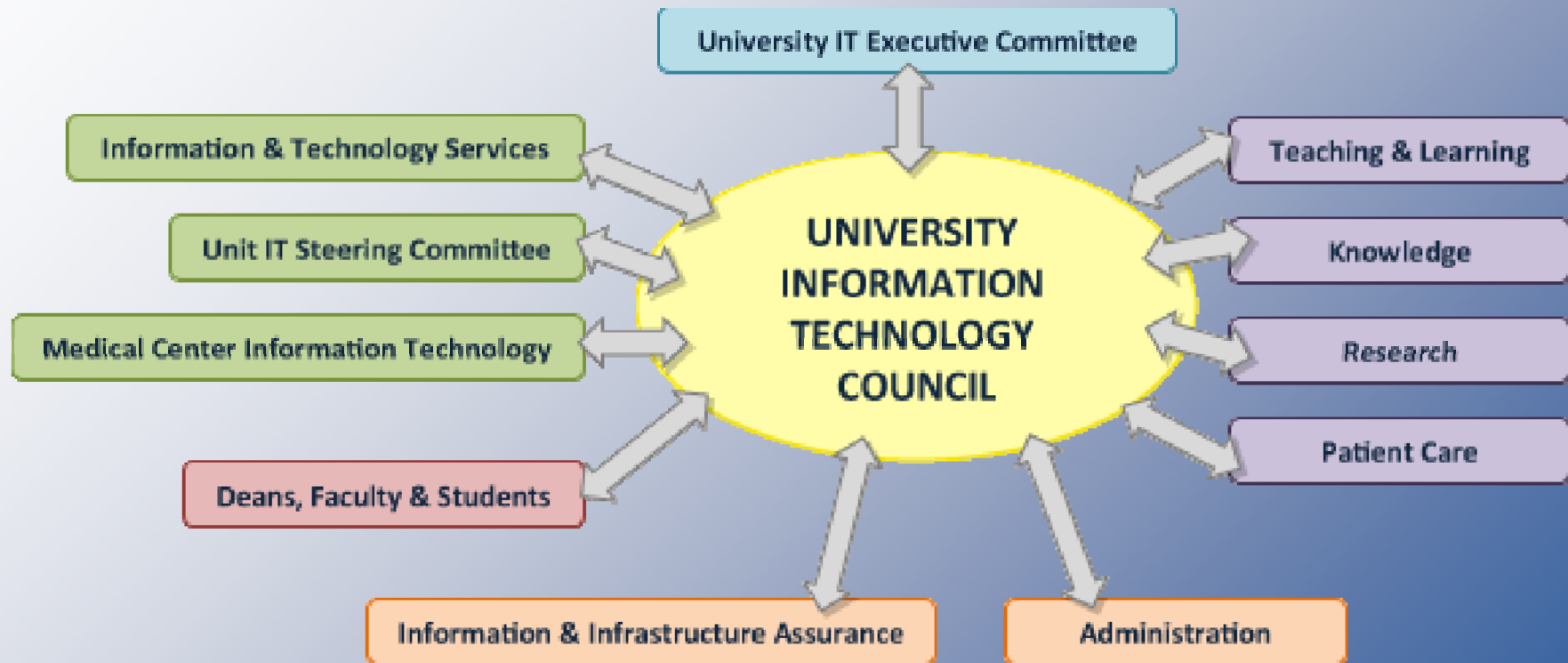
Source/Use At-A-Glance Report

(Currently, the inclusion/exclusion of year-end adjustment activity, Period 998, may result in different totals than the nVision Source/Use Projections report.)

Balances	4 Year Trend	FY 2006	FY 2007	FY 2008	FY 2009
Beginning Balance		\$16,289,371	\$15,461,515	\$13,444,717	\$12,092,772
Ending Balance		\$15,461,515	\$13,444,717	\$12,092,772	\$9,379,300
Ending Balance as a % of Appropriations		35.5 %	29.7 %	26.3 %	19.4 %
Ending Balance as a % of Total Sources		15.4 %	13.0 %	11.1 %	8.3 %
Net Change in Balance		(\$827,856)	(\$2,016,798)	(\$1,351,945)	(\$2,713,471)

Sources	FY 2010 through Dec 2009	% of Total	4 Year Trend	4 Year Growth	FY 2006	FY 2007	FY 2008	FY 2009
Total Sources	\$75,551,182	100.00 %		3 %	\$100,513,887	\$103,290,446	\$108,677,616	\$113,385,625
Appropriations	\$48,803,431	64.60 %		3 %	\$43,525,696	\$45,217,715	\$46,003,738	\$48,331,865
Internal Departmental Rebill	\$20,937,633	27.71 %		1 %	\$52,036,006	\$53,046,720	\$49,502,586	\$54,758,832
External Department Revenue	\$5,253,553	6.95 %		36 %	\$2,849,012	\$3,929,721	\$11,466,981	\$9,624,511
General Fund Transfers	\$500,000	0.66 %		-22 %	\$1,751,316	\$881,833	\$1,488,909	\$663,550

IT Governance



BI Community

- Business Intelligence Community of Experts (BICE)
- www.businessintelligence.umich.edu
- BI Events
- BI Small Networking Groups
- BI Awards
- BI Consulting

Business Intelligence Adoption

- M-Reports usage has doubled since 2008
- Business Intelligence Community of Experts: 445 members
- Popular BI Events:
 - Streamlining the Data Flow Process with ETL Best Practices
 - Visualizing Data for Business Reporting and Analysis
 - Making Sense of Analytical Data Structures

What's Next?

- More content in M-Reports
- Continue Next Generation Data Warehouse
- More statistical analysis, forecasting, predictive modeling, optimization
- Look at query tool options for power users
 - Improve Business Objects experience
 - And/or look at other tools (e.g. Tableau)

Space Utilization: Behavior Changed

- Slowed growth of new space avoiding approximately \$462 million in one-time costs and \$18 million in recurring costs
- Shifting campus culture: space is must be shared and managed effectively for the good of the institution
- New process for units requesting a new building, additions, or major renovation
- Enhanced central system and reporting to show classroom and research space utilization
- Institutional policies on how classrooms, research space, offices, and food service venues are assigned or used
- Repurposing underutilized space for higher-priority needs

Conclusion

- Build a Community
- Develop the Data Infrastructure
- Present the Information
- Have Strategies to Change Behavior

DISCUSSION QUESTION

What are the best practices in decision support?

What should be the mission, values and goals of a decision support function or organization?

15
minutes

BEST PRACTICE PERSPECTIVES:

DEVELOPMENT AND EVOLUTION OF DECISION SUPPORT

Aaron Walz

Director of Decision Support

Administrative Information Technology Services

University of Illinois

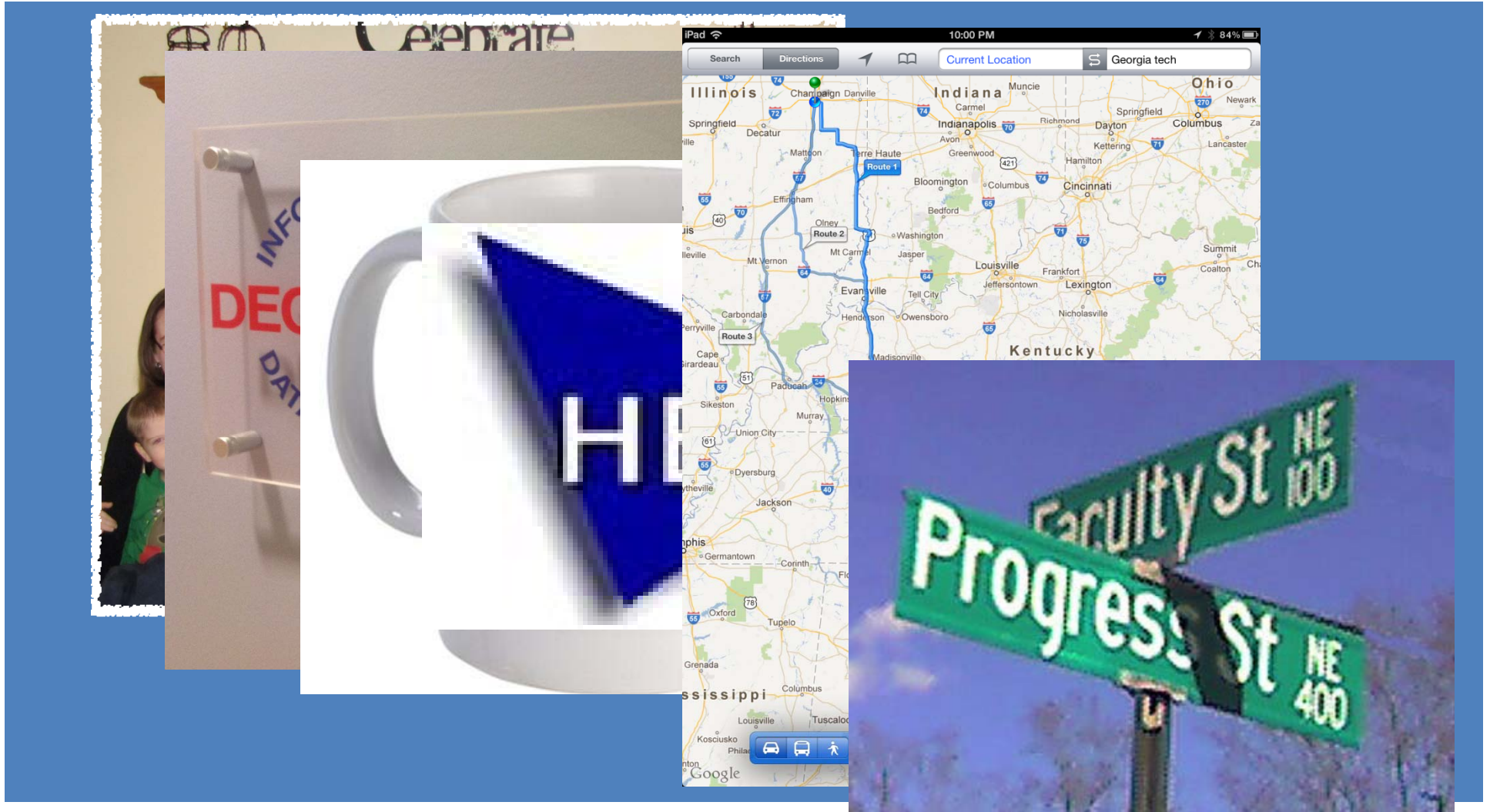
Business Intelligence at Illinois

Aaron Walz – Director of Decision Support



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URBANA-CHAMPAIGN • CHICAGO • SPRINGFIELD

A bit about me



UNIVERSITY OF ILLINOIS
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Overview

- Current state of BI in Higher Ed
- Illinois' BI story
- Customers and culture
- Scope and organization
- Technology
- Strategy
- Lessons learned

BI Current State

- Disclaimer
- ECAR Report
- Working Definitions
- BI Future State
- Why is BI so hard in Higher Ed?

The University of Illinois

- Founded in 1867
- 3 physical campuses (Urbana-Champaign, Chicago, Springfield), and University Administration
- Leading public university in Illinois with significant impact on economy
- \$4.76 billion operating budget in 2010-2011
- 76,886 students on 3 campuses
- 19,047 degrees awarded in 2009-2010
- 5,654 faculty
- 27,700 non-faculty employees (incl. grad. asst.)
- Premier research and discovery

Illinois' BI Story

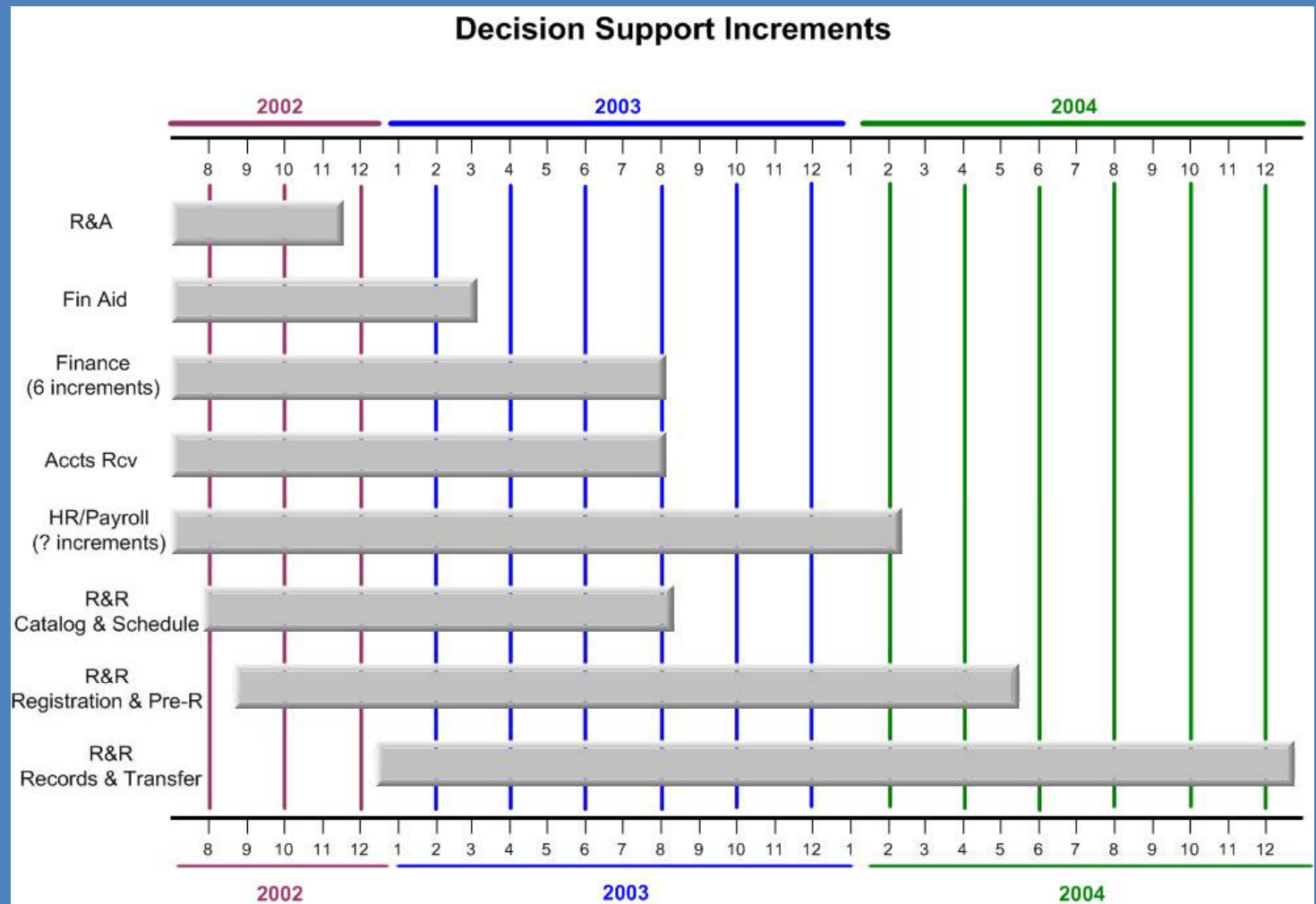
- Central IT reporting (prior to 1994)
- Past warehouse-like projects (1995-1999)
- ERP implementation of SCT Banner (UI-Integrate project 2000 – 2005)
- ERP planning team (1998-1999) told they must have a way to “get the data out of the ERP”
- Parallel development of Data Warehouse with SCT Banner implementation
- Decision Support team launched in 2001 with intention of building a permanent unit
- Executive Sponsor: Planning & Budgeting

Building the Data Warehouse

\$17 M

54 FTE

Parallel projects



Shift to Self-Service Reporting



here lies the Report Fairy

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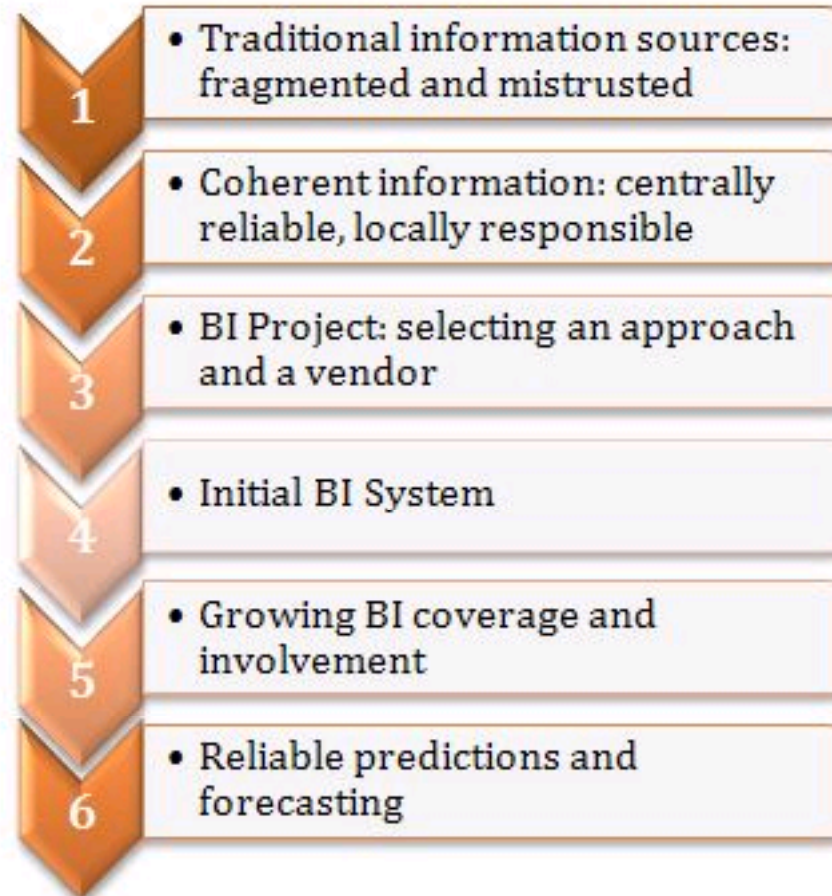
From project to department

- Maintenance and operations
- Awareness and adoption
- Organizational changes
- Merger with Central IT

Continuing the evolution

- Adding data sources
- Building out the data layer
- Adding BI interfaces

Where are we in the lifecycle?



<http://www.jiscinfonet.ac.uk/infokits/strategy/environment-scanning/maturity-model>

Customers and Culture

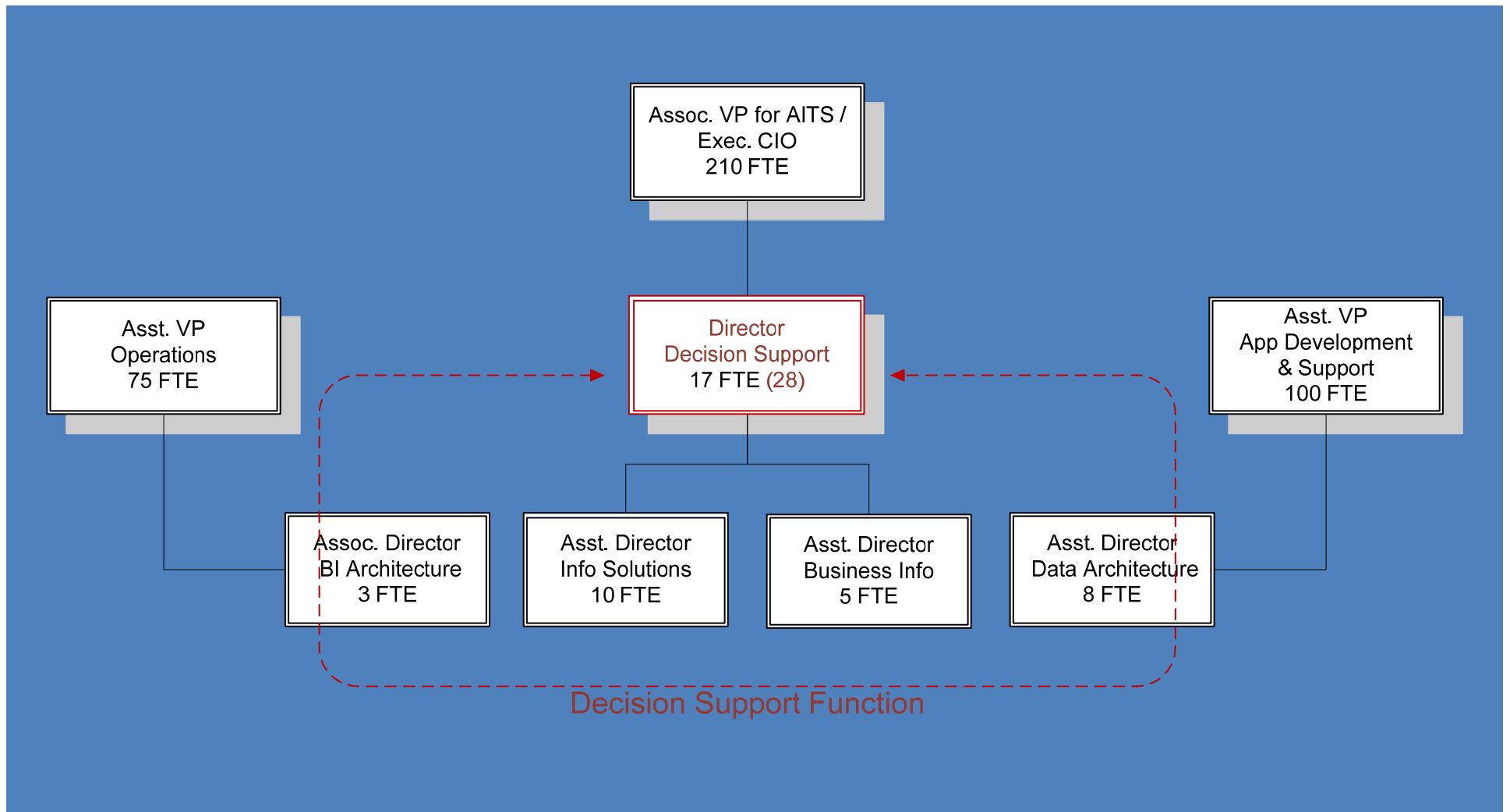
- Types of customers and needs
- Relationship with other central offices
 - Functional offices
 - IR
 - Central IT: history, merger
- UI culture: highly decentralized, distributed, and independent

Direct Users of Data Warehouse

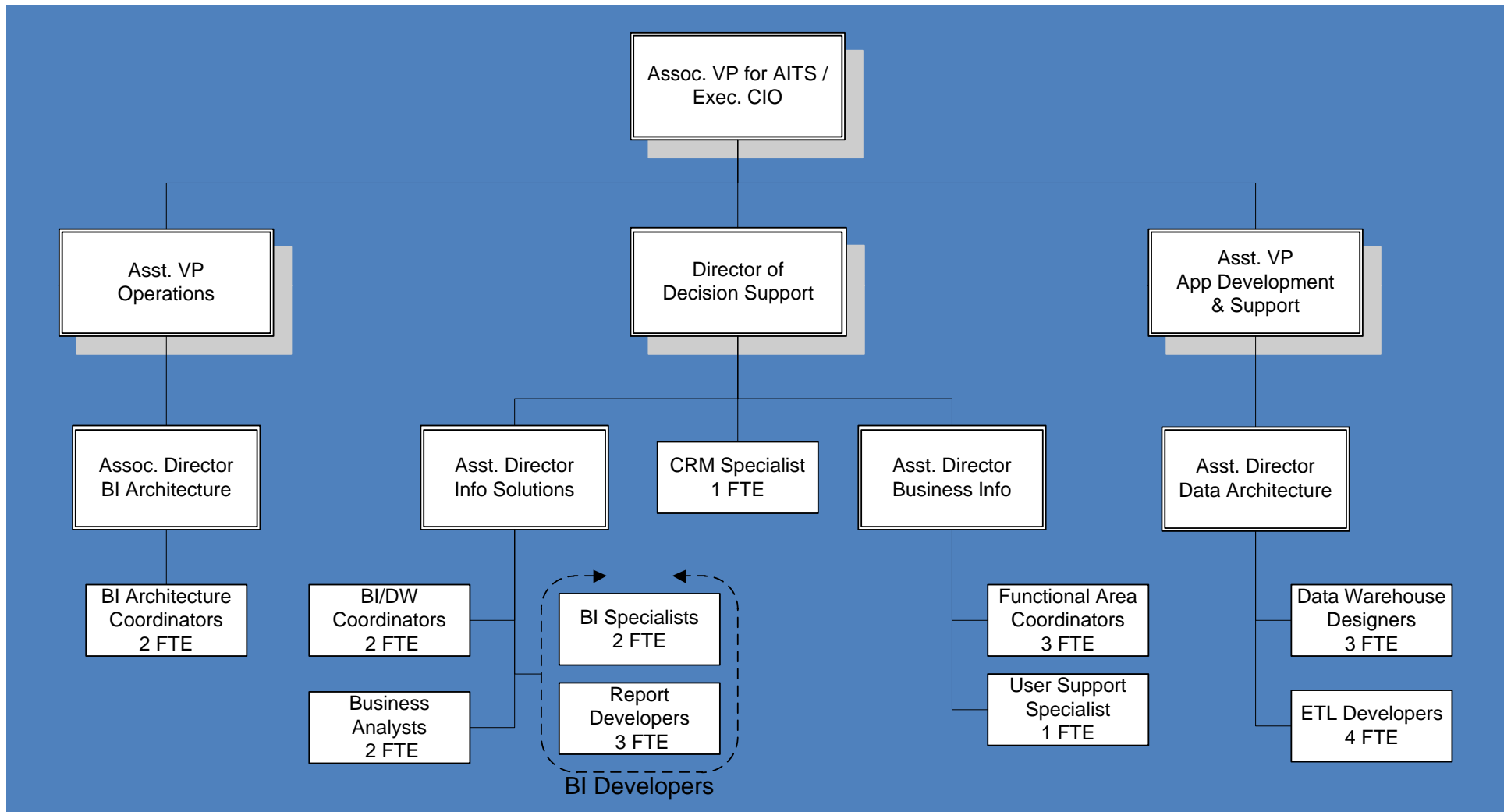
- 1,800 ad-hoc users from over 430 departments
- 1.6 million database sessions during FY 2011
- 10.5 million queries ran during FY 2011
- Approximately 5,000 accounts in the BI/DW environment



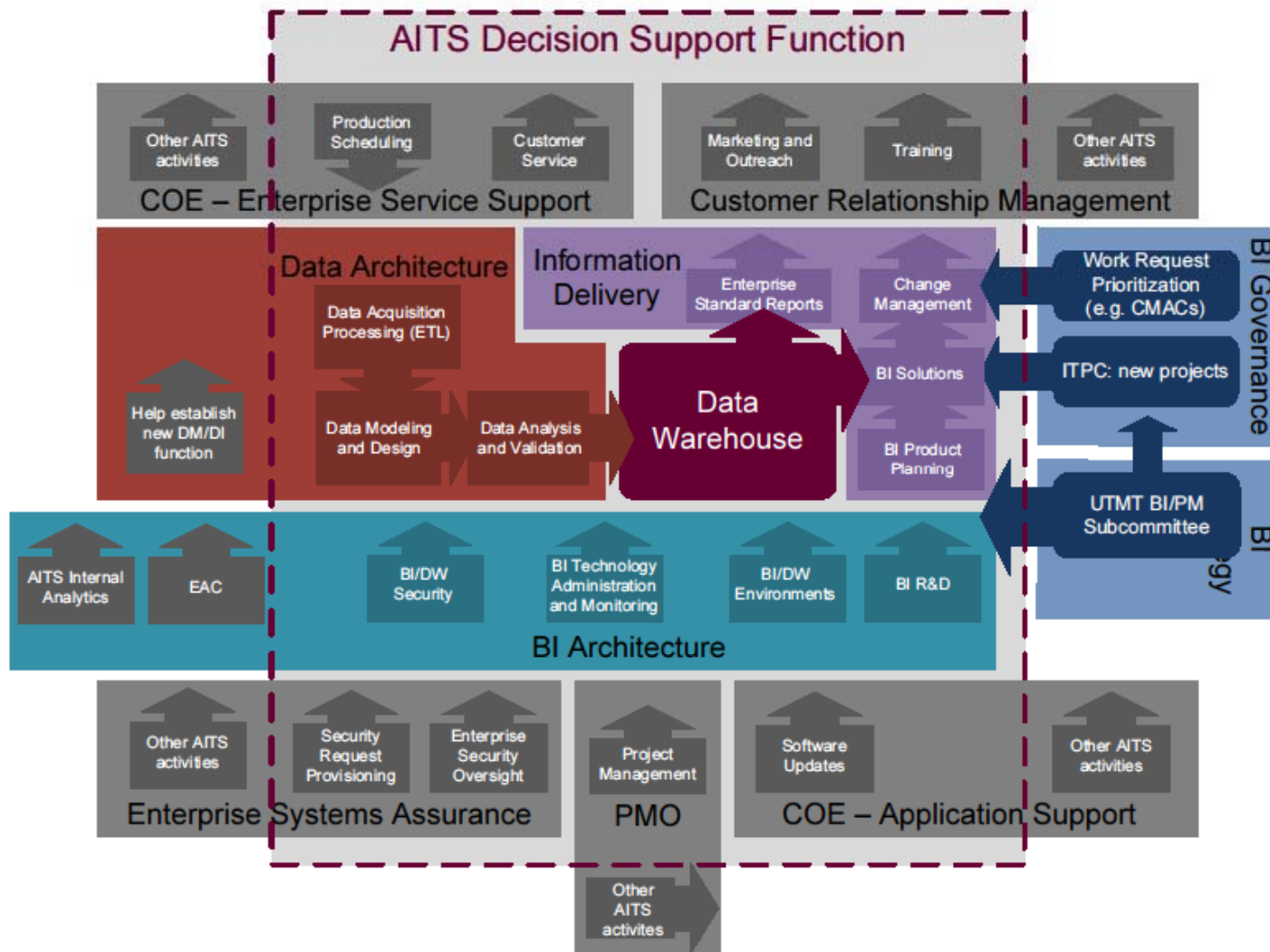
2012 Organization and Staffing



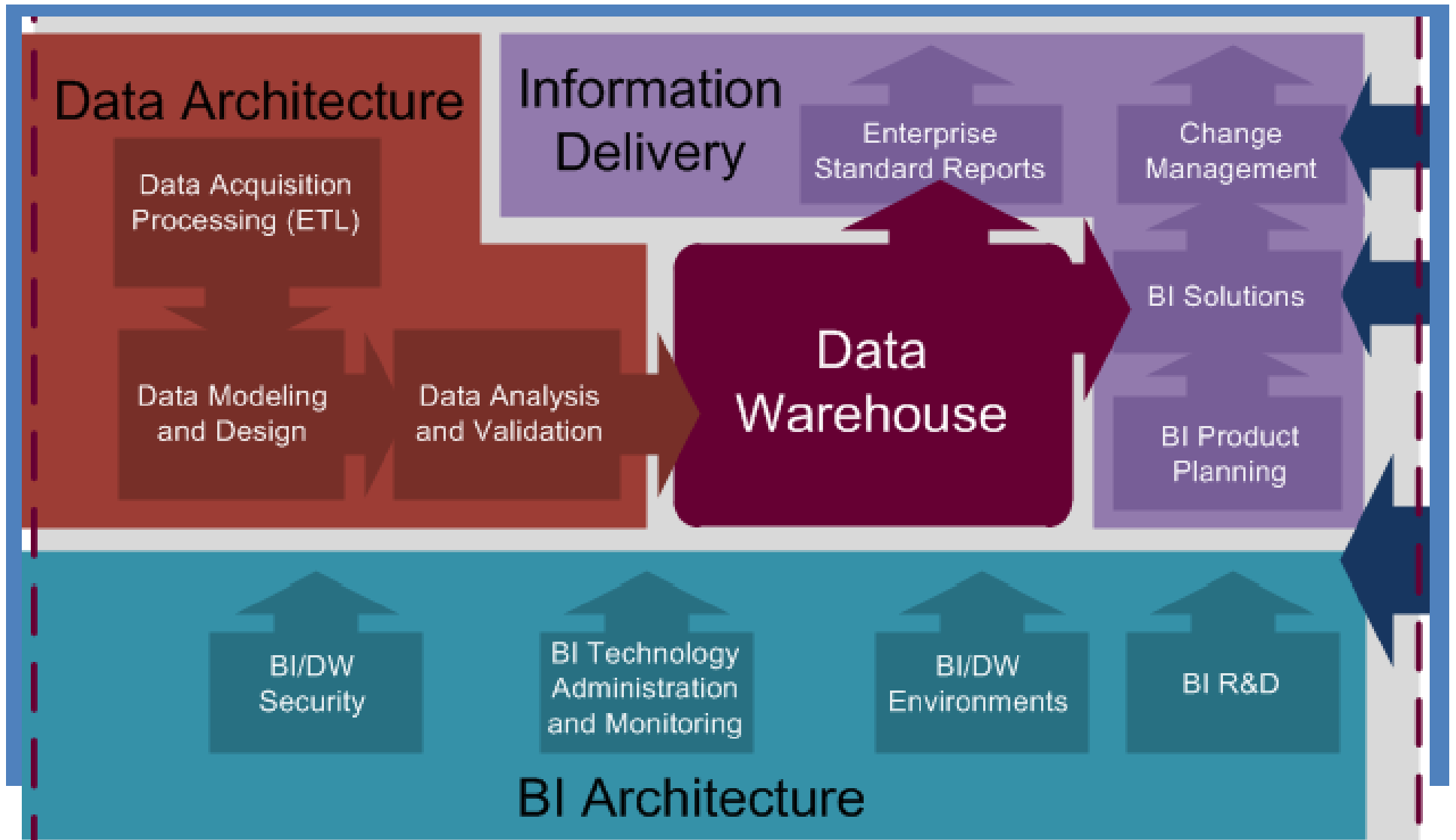
Organization and Staffing

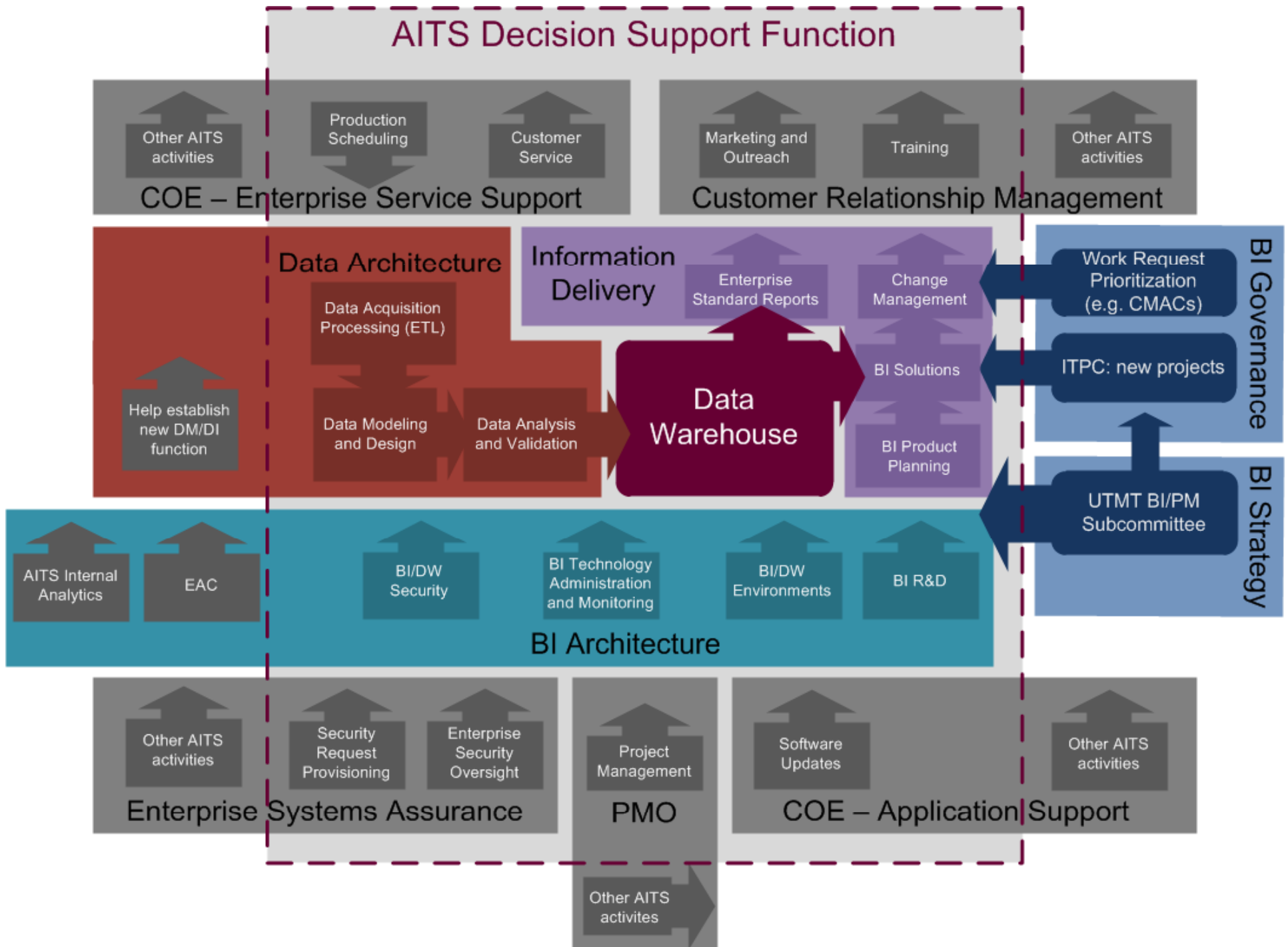


Services and Operations

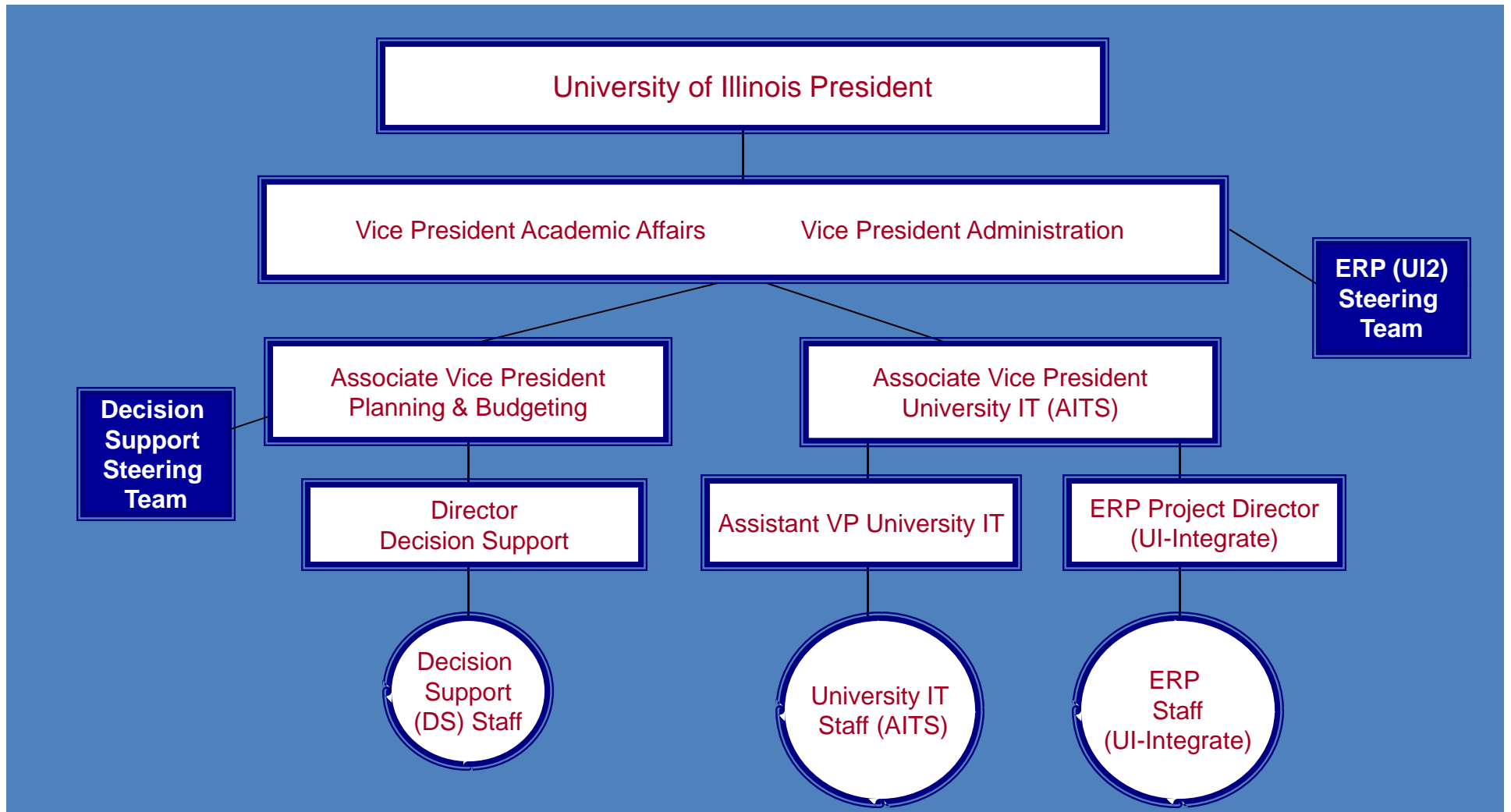


Services and Operations

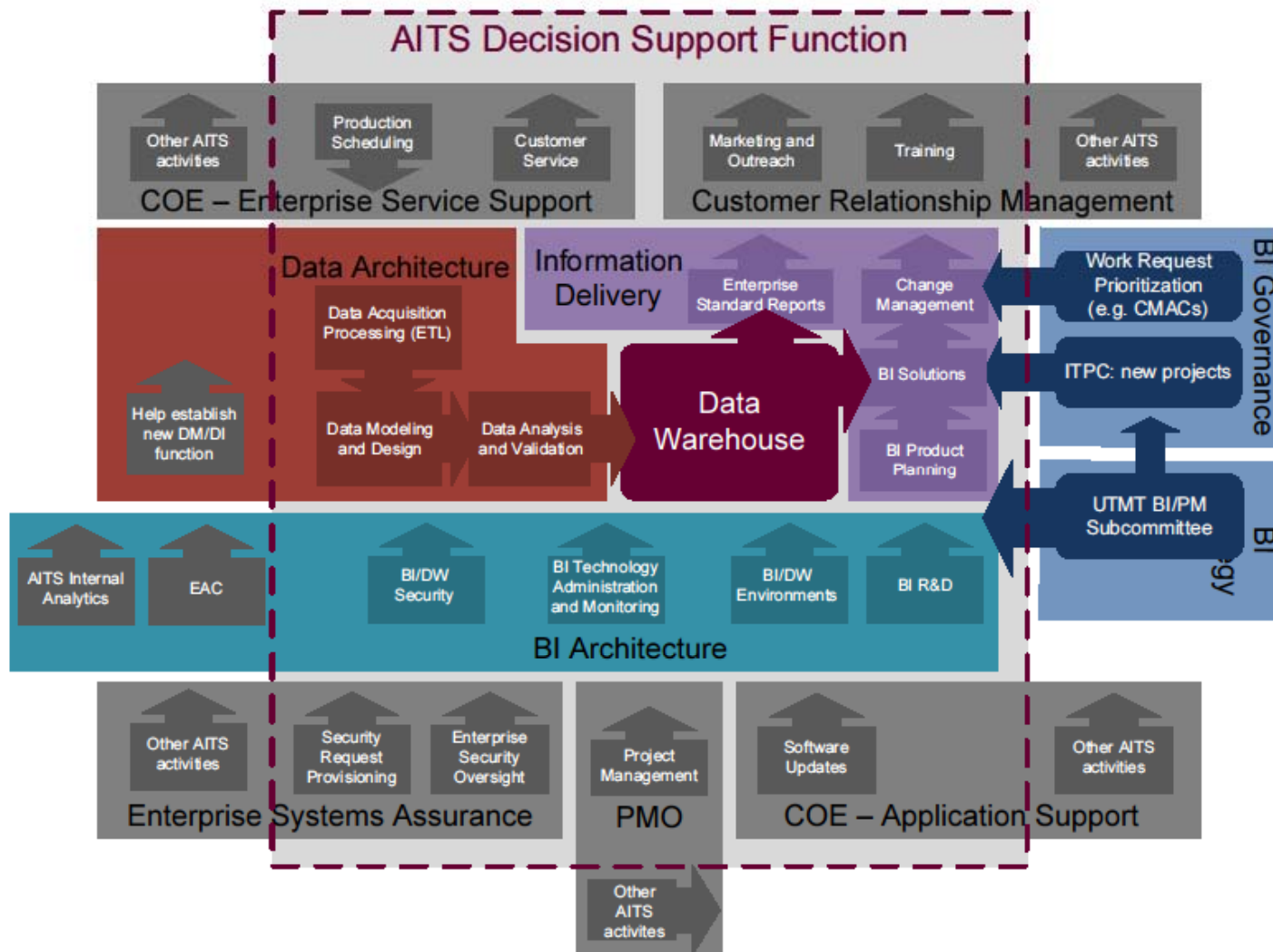




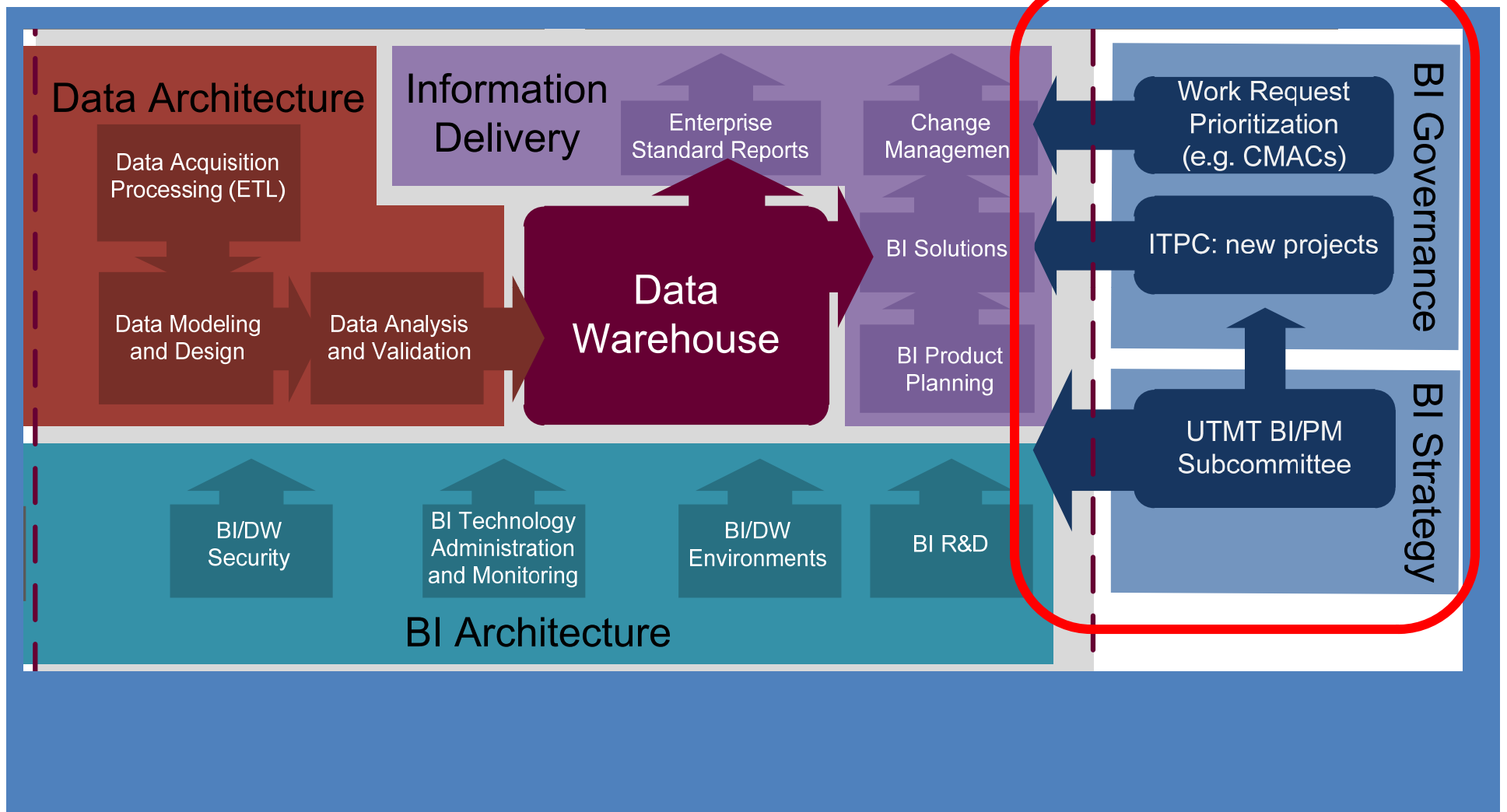
Governance during ERP



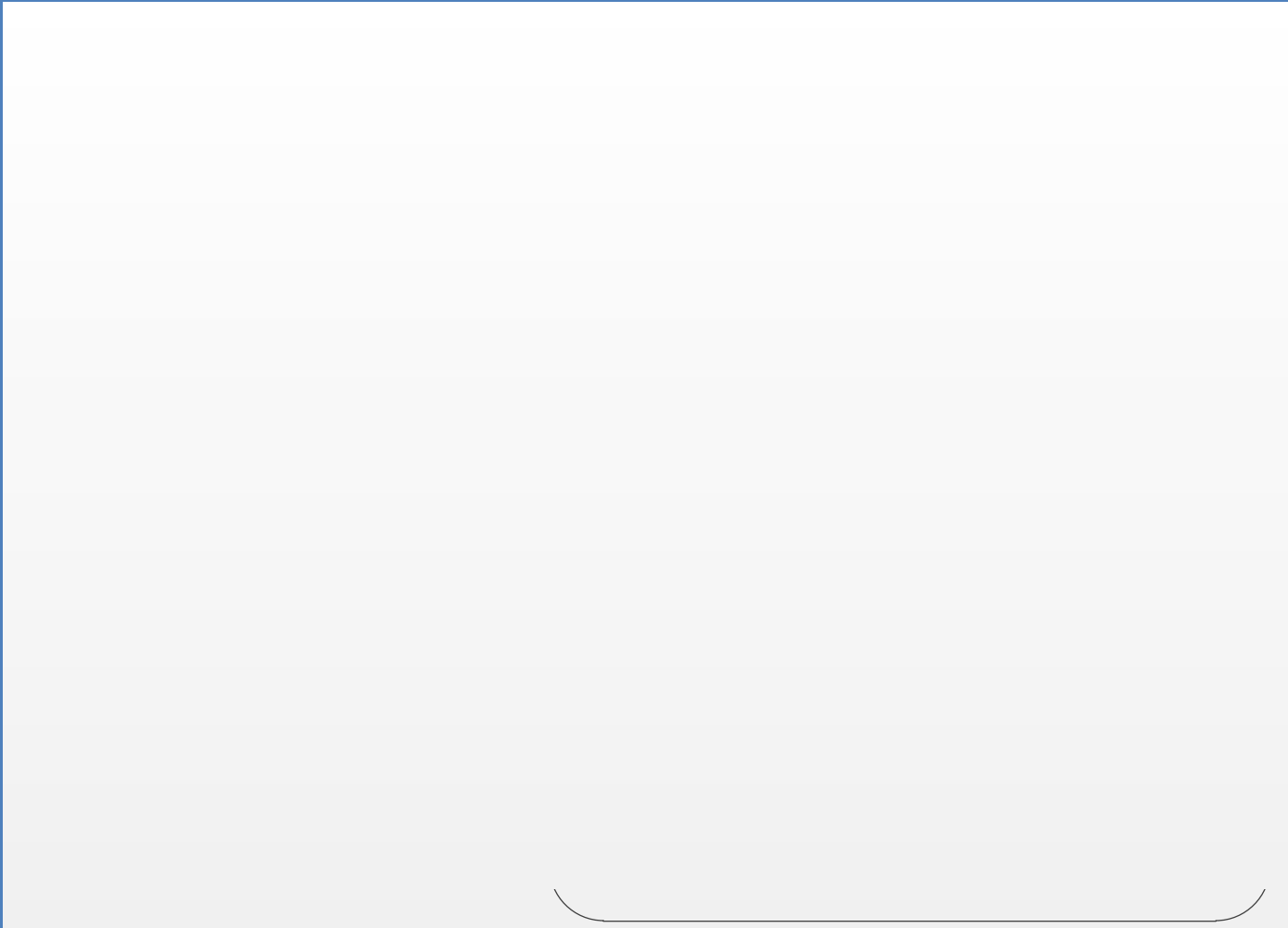
BI Governance now

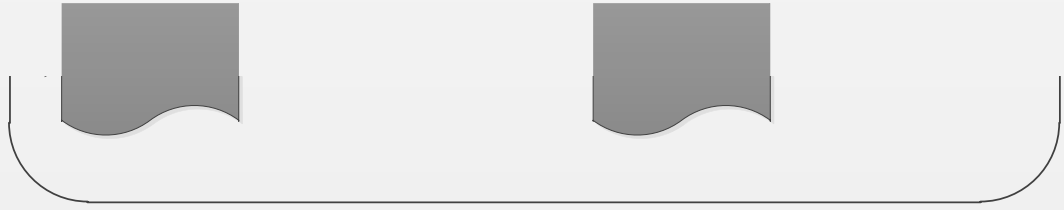


BI Governance now



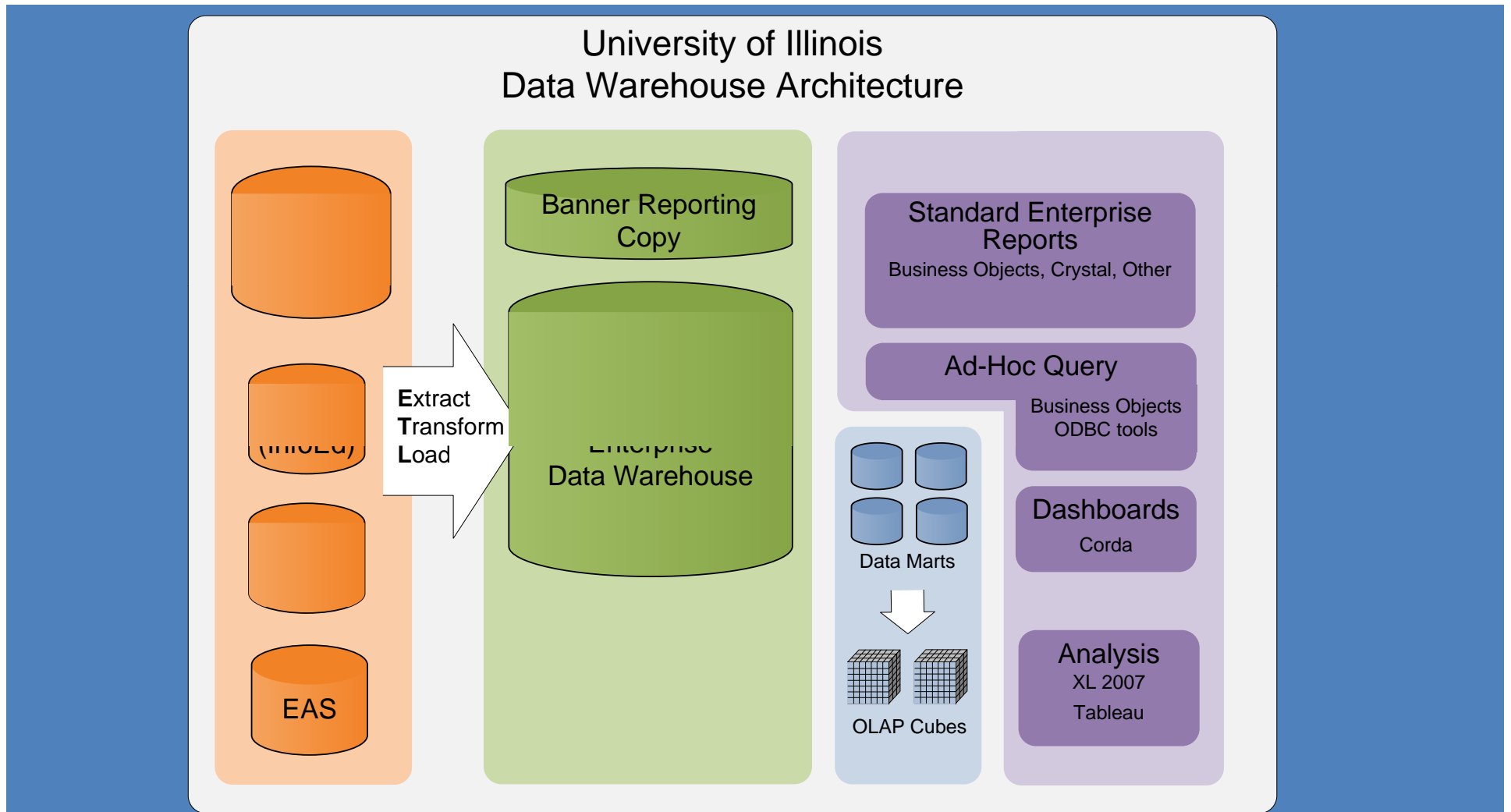
BI Governance now



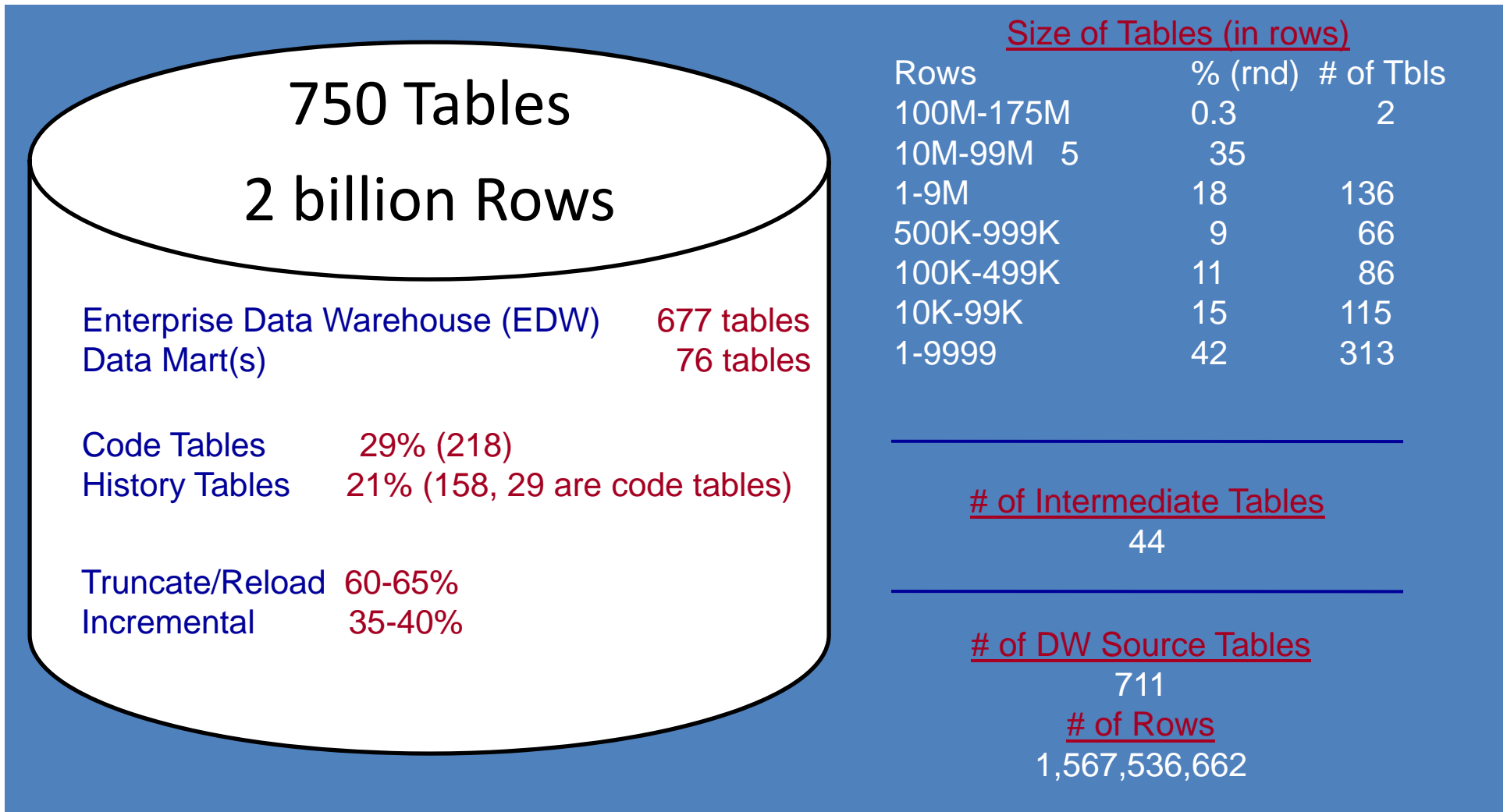


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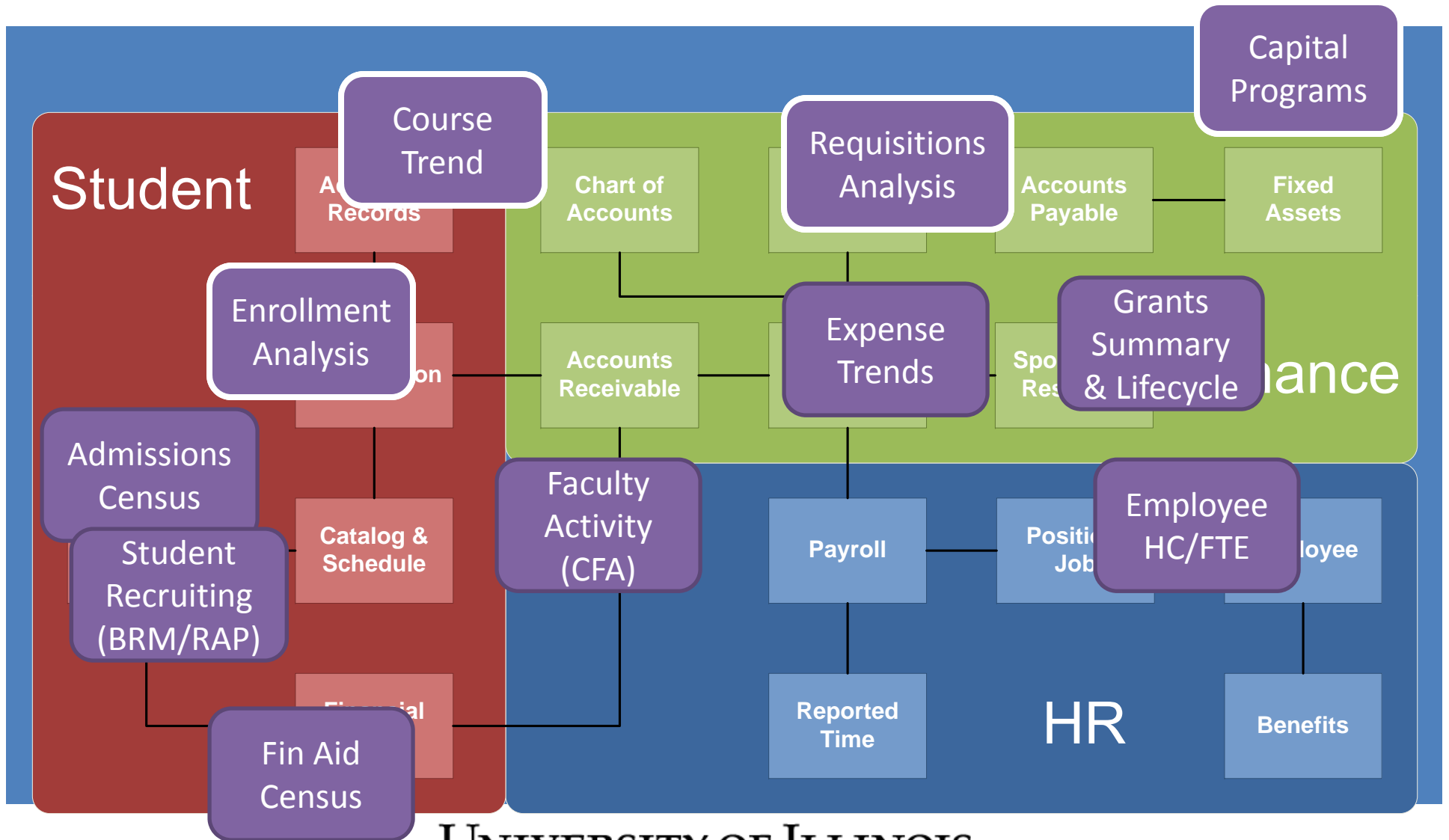
Technology



Data Warehouse Environment



What data does we have?



BI Strategy

- Changes in focus over time
- Key strategic themes/anchors

BI Strategy

- Future vision and plans
 - Institutional Standard Answers and the limits of self-service BI
 - Next-generation BI
 - Desired future state
 - Getting from here to there
 - What about KPIs? What about Analytics?

Lessons and Challenges

- Adoption and the limits of “build it and they will come”
- Is self-service BI the holy grail?
- Know your customers
- Use the right tool for the right job
- Build prototypes
- Collaborative BI in a distributed culture

Questions and Discussion



Aaron Walz

Director of Decision Support

awalz@uillinois.edu

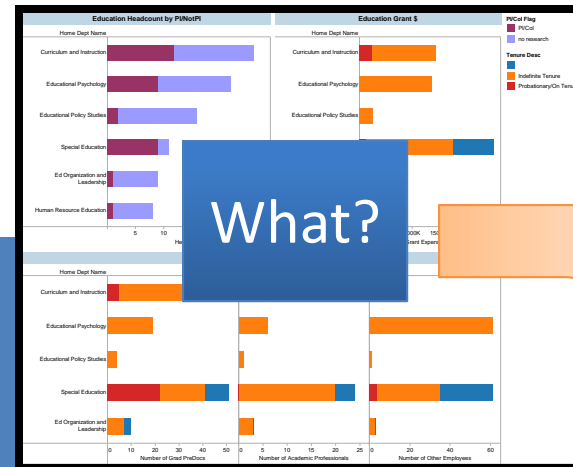
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BI Products Demo



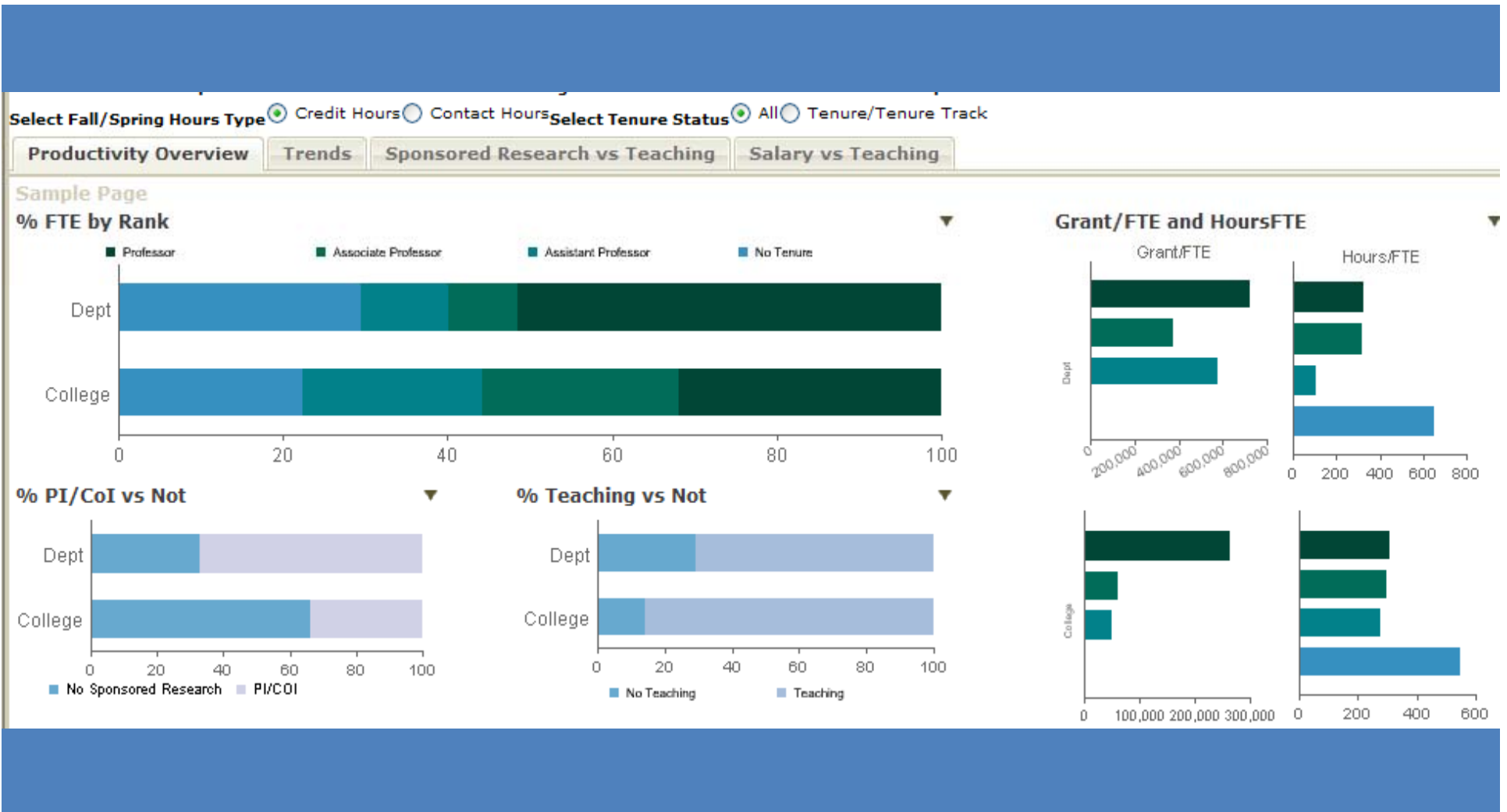
Integrated BI

- Dashboards
 - Lay of the land
 - Monitoring: what
- Analysis (OLAP)
 - Explore
 - Analysis: why
- Custom Reports
 - Catalog findings
 - Lists: look up specific details



Home Dept Name	Faculty Name	Sal	As	Col	Grant	Co	Grant	Expense
Curriculum and Instruction	AbrahamLincoln	0.00	0.00					\$0
	AndrewJackson	1.00	0.00					\$0
	FranklinPierce	0.00	2.00					\$0
	GeorgeWashington	1.00	0.00					\$114,550
	JamesDuchanein	0.00	0.00					\$0
	JamesKnoxPolk	0.00	0.00					\$0
	JamesMadison	0.00	1.00					\$0
	JamesMonroe	1.00	0.00					\$6,641
	JohnAdams	0.00	0.00					\$0
	JohnQuincyAdams	1.00	0.00					\$363,395
	JohnTyler	1.00	0.00					\$132,675
	MartinVanBuren	0.00	1.00					\$0
	MillardF	0.00	0.00					\$69,924
	Thomas	0.00	0.00					\$604,917
	William	0.00	0.00					\$14,257
	Zachary	0.00	0.00					\$25,504
Curriculum and Instruction								\$1,430,903.25
Ed Organization and Leadership	Andrew	0.00	0.00					\$303,076
	JamesG	0.00	0.00					\$0
	Rutharfo	0.00	0.00					\$63,308
	Ulysses	0.00	0.00					\$44,543
Ed Organization and Leadership								\$410,927.37
Educational Policy Studies	BenjaminHarrison	2.00	0.00					\$188,979
	CharlesArthur	0.00	0.00					\$40,701
	GrowerCleveland	0.00	0.00					\$0

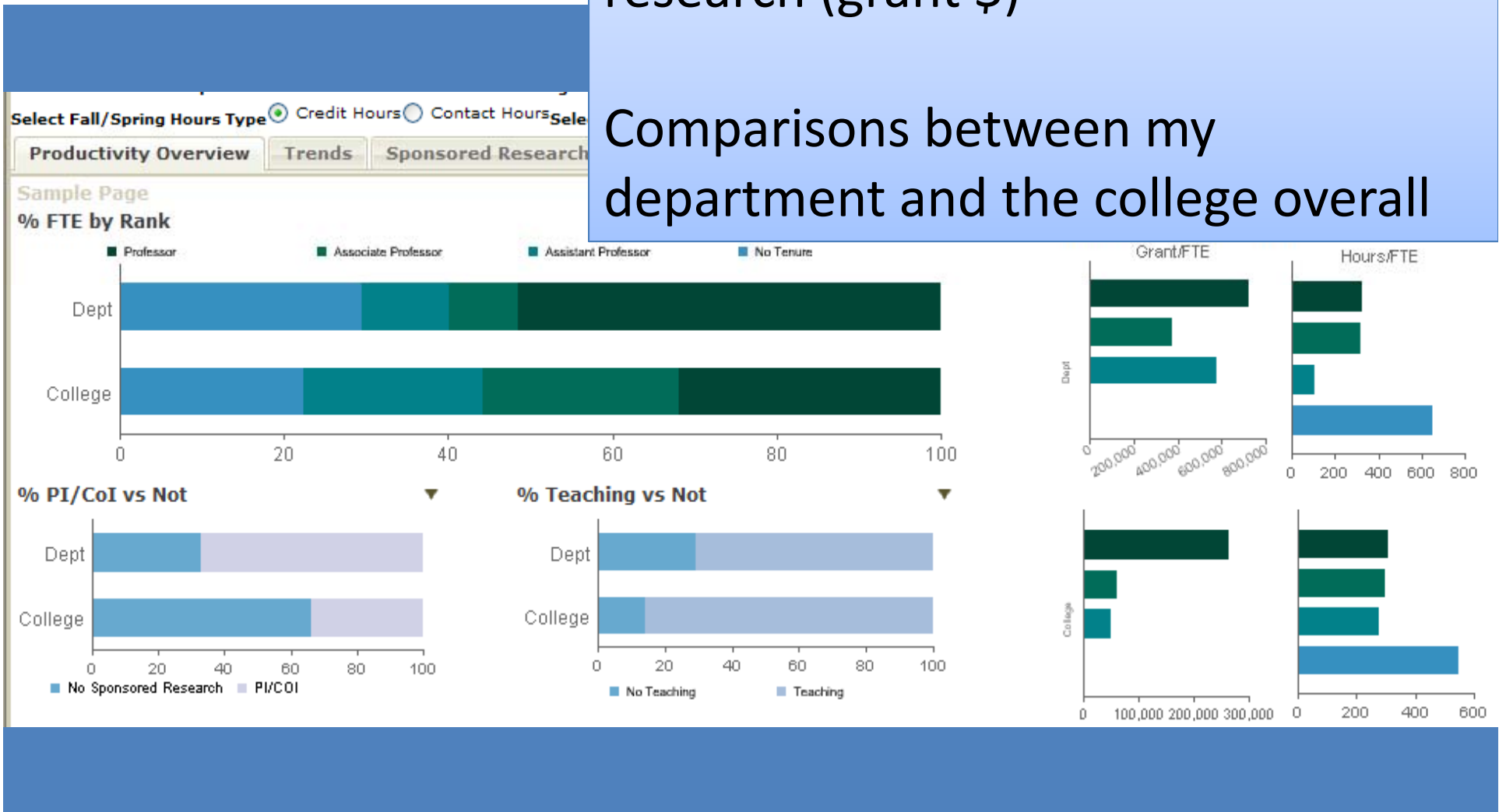
Faculty Productivity Dashboard



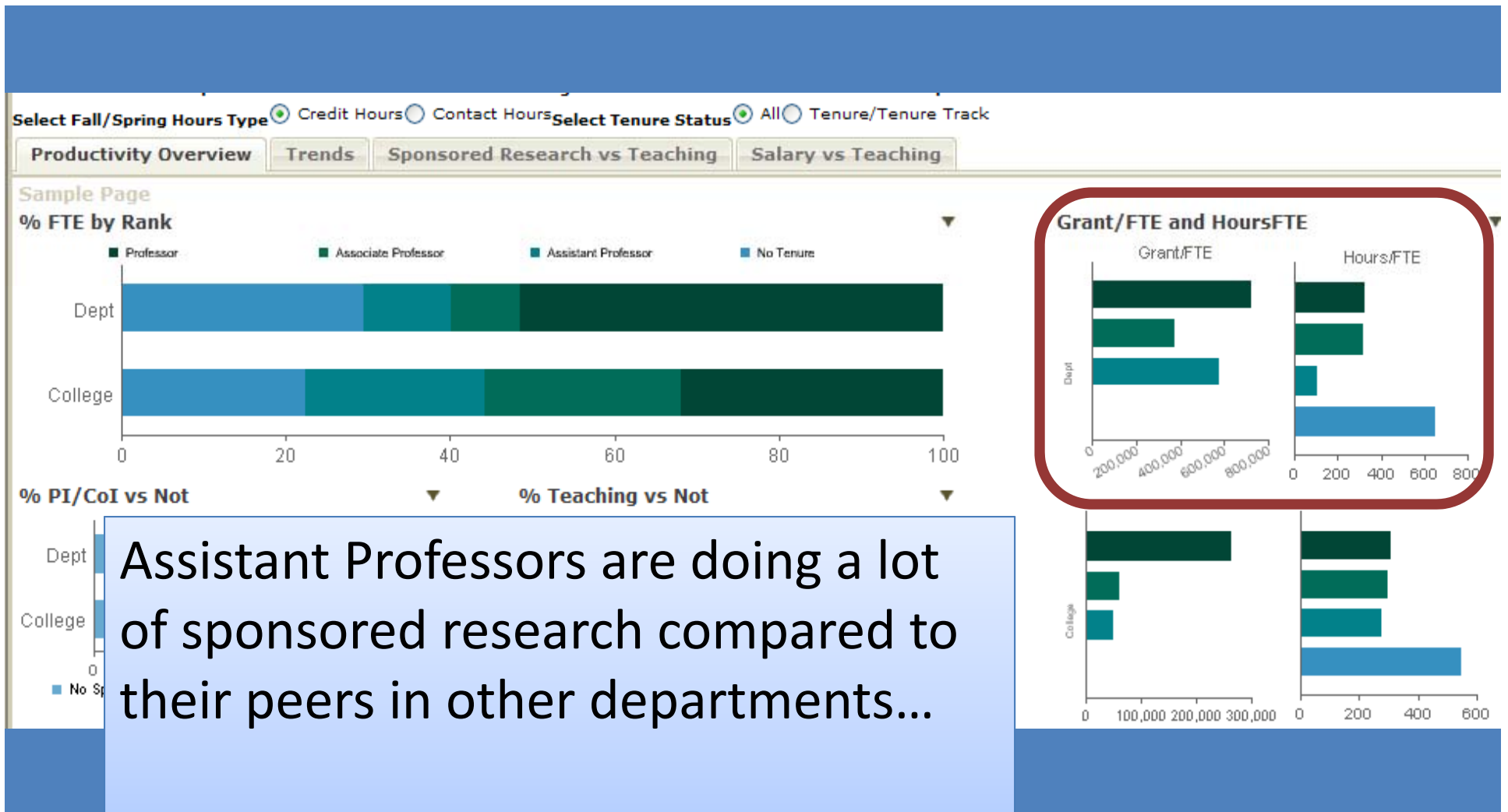
Faculty Pro

Overview of Faculty productivity in terms of teaching and sponsored research (grant \$)

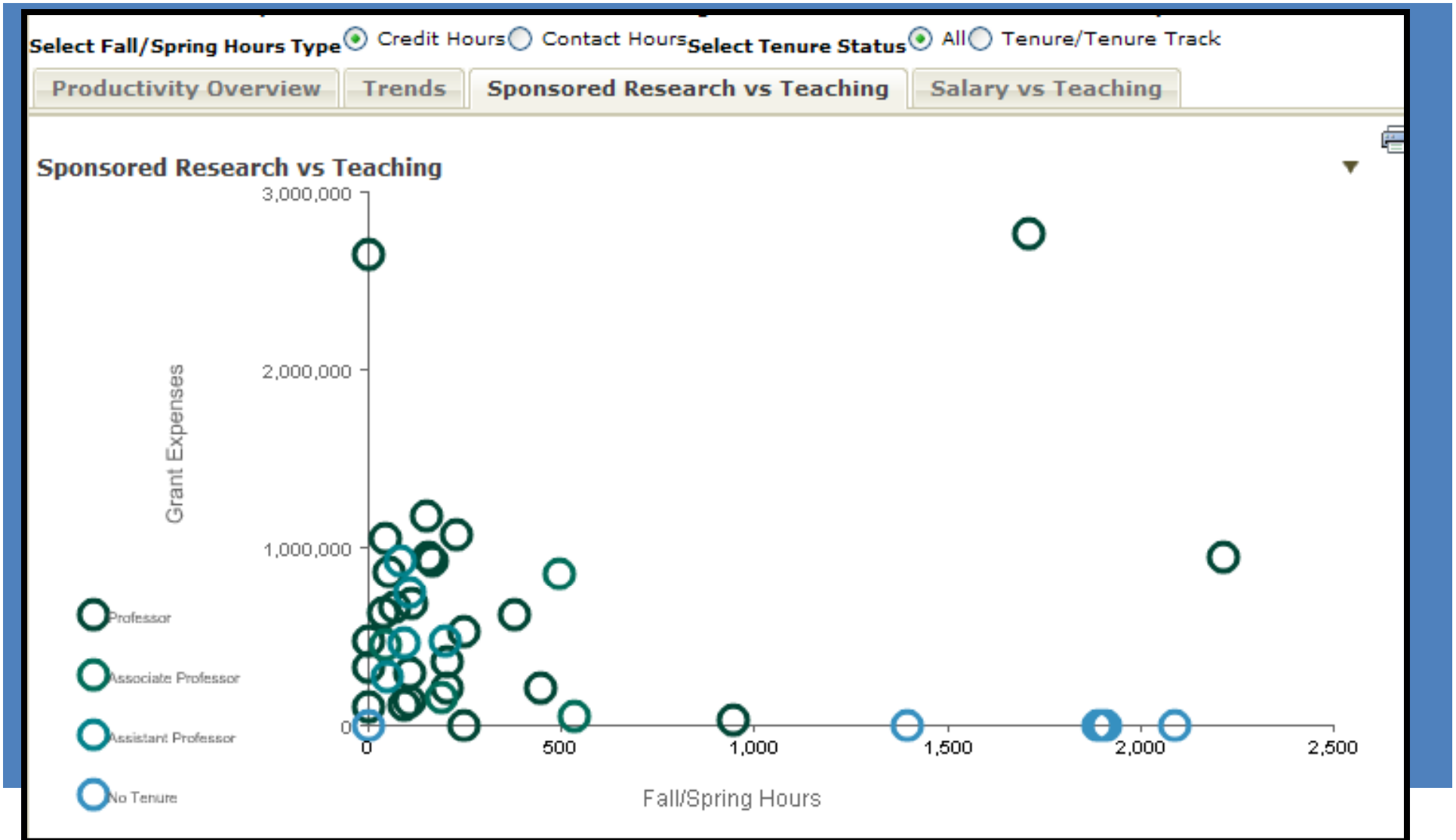
Comparisons between my department and the college overall



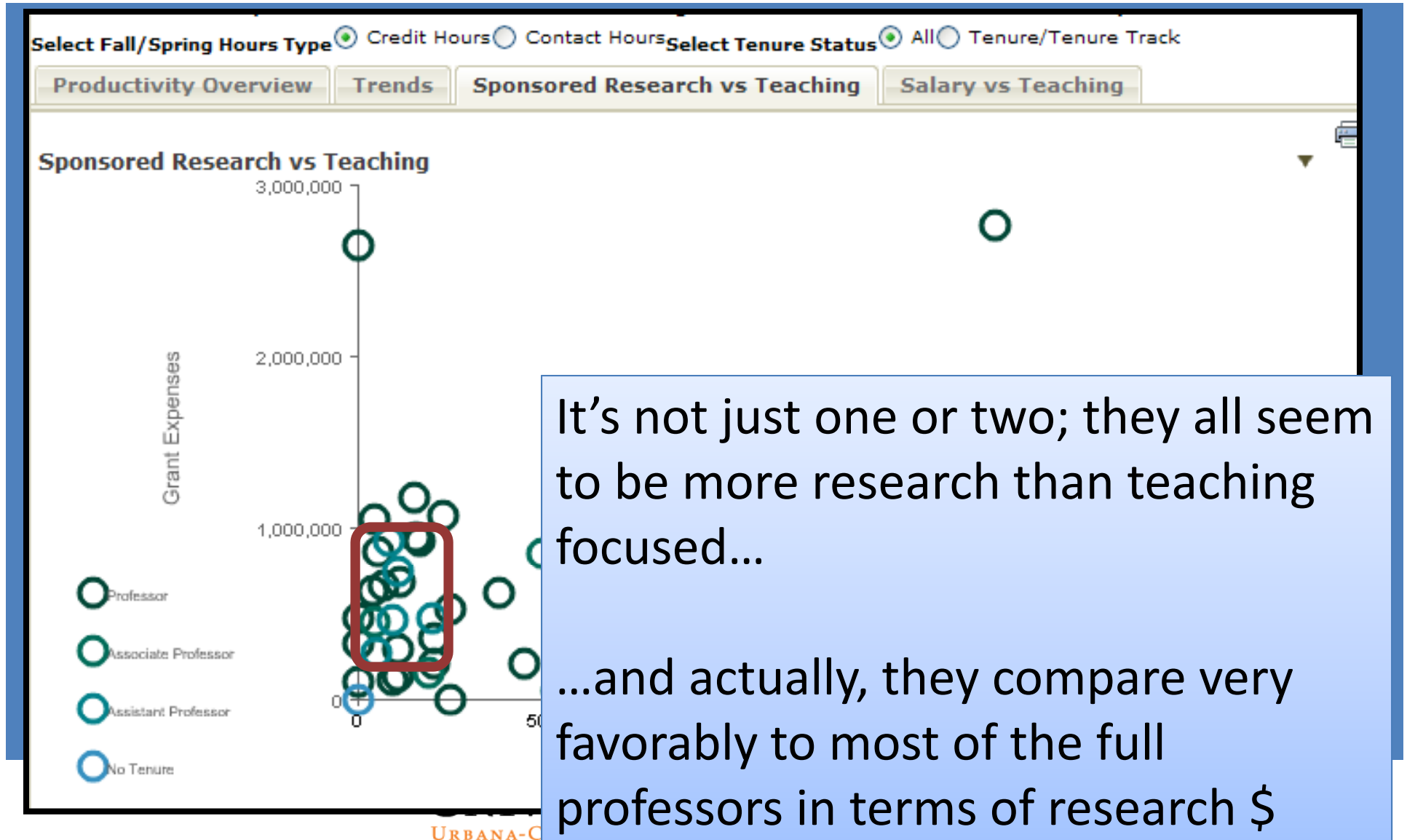
Faculty Productivity Dashboard



Faculty Productivity Dashboard



Faculty Productivity Dashboard



Faculty Ac

This is Excel, so we can easily add some calculations of our own...

Assistant Professor			Associa		
Fall and Spring - Number of Credit Hours	FTE	Grant Expense Amt	Fall and Number Credit H		
1220	6	\$ 2,073,267			
1040.4	8	\$ 2,219,179			
583.8	6	\$ 1,552,754			
764.2	6	\$ 2,559,054			
526.7	5	\$ 2,881,380			
0	5	\$ 1,538,978			
4135.1	36	12824611.21	5065.7	20	11215257.73
Credit Hrs/FTE	Grant \$/FTE	Credit Hrs/FTE	Grant \$/FTE	Credit Hrs/FTE	Grant \$/FTE
203	\$ 345,544	812	\$ 765,059	293	\$ 416,182
130	\$ 277,397	465	\$ 583,368	235	\$ 397,359
97	\$ 258,792	130	\$ 623,305	294	\$ 530,465
127	\$ 426,509	243	\$ 477,288	249	\$ 641,503
105	\$ 576,276	315	\$ 377,034	317	\$ 711,455
0	\$ 307,796	0	\$ 617,037	0	\$ 517,985

Faculty Ad-Hoc Reports

The screenshot displays the 'Query Panel - EDW - STU Registration Instruct Asg Universe' interface. The window title is 'Query Panel - EDW - STU Registration Instruct Asg Universe'. The 'Scope of Analysis' is set to 'None'. The 'Classes and Objects' pane on the left shows a tree view of database objects, with 'COURSE & SESSION INFORMATION' expanded to show fields like 'Course ID', 'Course Subject Code', 'Course Number', 'Course Status Code', 'Course Title', 'CIP Code', 'Course Contact Hour Indicator', 'Course Minimum Contact Hour', 'Course Maximum Contact Hour', 'Course Continuing Education Ind', 'Course Organization', 'Course Attributes', 'Cross Listed Course Information', and 'Session Information'. The 'Result Objects' pane on the right shows a list of selected fields: 'Job Detail Title', 'Last Name', 'First Name', 'Course Number', 'Course Subject Code', 'Course Title', 'Term Code', and 'Session Credit Hour'. The 'Conditions' pane on the right shows a query filter: 'Job Detail College Code Equal to 'KV'', 'And', 'Job Detail Department Name Equal to 'Chemistry'', 'And', 'Or', 'Term Code Equal to '120101'', and 'Term Code Equal to '120098''. The bottom of the window has buttons for 'Options...', 'Save and Close', 'View...', 'Run', and 'Cancel'.

Faculty Ad

Ad-Hoc Query tools let us create custom reports without having to be a developer...

...I can drag and drop the fields I want, and create filters

The screenshot displays the 'Query Panel - EDW - STU Registration Instruct Asg Unive' interface. On the left, the 'Classes and Objects' pane lists various data sources, including 'COUNTS', 'TIME', and 'COURSE & SESSION INFORMATION'. The 'COURSE & SESSION INFORMATION' category is expanded, showing fields like 'Course ID', 'Course Subject Code', 'Course Number', 'Course Status Code', 'Course Title', 'CIP Code', 'Course Contact Hour Indicator', 'Course Minimum Contact Hour', 'Course Maximum Contact Hour', 'Course Continuing Education Ind', 'Course Organization', 'Course Attributes', 'Cross Listed Course Information', and 'Session Information'. The 'Results' pane on the right shows a list of selected fields: 'Course Subject Code', 'Course Title', 'Term Code', and 'Session Credit Hour'. Below the results pane, the 'Conditions' pane contains a logical filter structure: 'Job Detail College Code Equal to 'KV'' is connected to 'Job Detail Department Name Equal to 'Chemistry'' via an 'And' connector. This 'And' group is further connected to an 'Or' group containing 'Term Code Equal to '120101'' and 'Term Code Equal to '120098'' via another 'And' connector. At the bottom of the interface, there are buttons for 'Options...', 'Save and Close', 'View...', 'Run', and 'Cancel'.

Faculty Ad-Hoc Reports

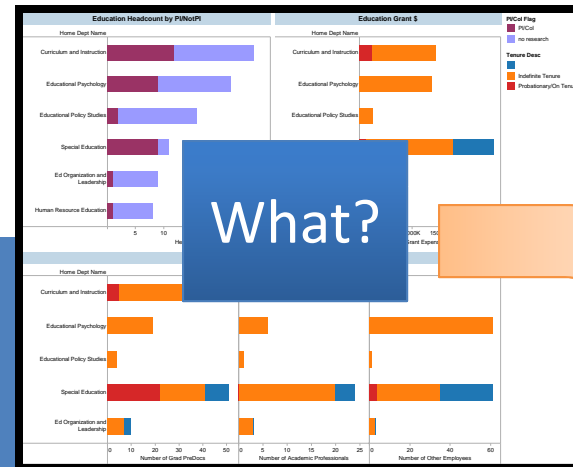
Term Code	Last Name	First Name	Course Subject	Course	Course Title	Session C
120098	Adams	Gretchen	CHEM	101	Introductory Chemistry	3
	Adams	Gretchen	CHEM	102	General Chemistry I	3
	Adams	Gretchen	CHEM	104	General Chemistry II	3
	Adams	Gretchen	CHEM	199	Undergraduate Open Seminar	1
	Adams	Gretchen	CHEM	202	Accelerated Chemistry I	3
	Allegretti	Lauren	CHEM	104	General Chemistry II	3
	Anderson	Nicholas	CHEM	103	General Chemistry Lab I	1
	Bartels	Steven	CHEM	103	General Chemistry Lab I	1
	Bendis	Elizabeth	CHEM	103	General Chemistry Lab I	1
	Bhat	Sheila	CHEM	103	General Chemistry Lab I	1
	Boulanger	William	CHEM	499	Senior Thesis	2
	Bradley	Alyssa	CHEM	101	Introductory Chemistry	3
	Braun	Paul				
	Braun	Paul				
	Braun	Paul				
	Braun	Paul				
	Braun	Paul				
	Braun	Paul				
	Braun	Paul				
	Braun	Paul				
	Brea	Ellie				
	Brom	Jac				
	Cason	Mic				
	Chang	Noe				
	Choules	Mar				
	Ciciora	Mat				
	Council	Mark	CHEM	203	Accelerated Chemistry Lab I	3

Reports are very effective for creating lists so I can look up specific values...

...here's a listing of who's teaching what Chemistry classes

Integrated BI

- Dashboards
 - Lay of the land
 - Monitoring: what
- Analysis (OLAP)
 - Explore
 - Analysis: why
- Custom Reports
 - Catalog findings
 - Lists: look up specific details



Why?

Home Dept Name	Tenure Desc	Headcount
Curriculum and Instruction	Indefinite Tenure	24
Curriculum and Instruction	Probationary/On Tenure Track	18
Ed Organization and Leadership	Indefinite Tenure	4
Ed Organization and Leadership	Probationary/On Tenure Track	6
Educational Policy Studies	Indefinite Tenure	3
Educational Psychology	Indefinite Tenure	1
Educational Psychology	Probationary/On Tenure Track	1
Human Resource Education	Indefinite Tenure	1
Human Resource Education	Probationary/On Tenure Track	1
Special Education	Indefinite Tenure	1
Special Education	Probationary/On Tenure Track	1
Grand Total		65

Lists

Home Dept Name	Faculty Name	Rate	As Col	Grant Co	Grant Expense
Curriculum and Instruction	AbrahamLincoln	0.00	0.00		\$0
Curriculum and Instruction	AndrewJackson	1.00	0.00		\$0
Curriculum and Instruction	FranklinPierce	0.00	2.00		\$0
Curriculum and Instruction	GeorgeWashington	1.00	0.00		\$114,550
Curriculum and Instruction	JamesDuchaneien	0.00	0.00		\$0
Curriculum and Instruction	JamesKnoxPolk	0.00	0.00		\$0
Curriculum and Instruction	JamesMadison	0.00	1.00		\$0
Curriculum and Instruction	JamesMonroe	1.00	0.00		\$6,641
Curriculum and Instruction	JohnAdams	0.00	0.00		\$0
Curriculum and Instruction	JohnQuincyAdams	1.00	0.00		\$363,395
Curriculum and Instruction	JohnTyler	1.00	0.00		\$132,675
Curriculum and Instruction	MartinVanBuren	0.00	1.00		\$0
Curriculum and Instruction	MillardF	0.00	0.00		\$69,924
Curriculum and Instruction	Thomas	0.00	0.00		\$604,917
Curriculum and Instruction	William	0.00	0.00		\$14,257
Curriculum and Instruction	Zachary	0.00	0.00		\$25,504
Curriculum and Instruction		0.00	1.00		\$1,300,903.25
Ed Organization and Leadership	Andrew	0.00	0.00		\$303,076
Ed Organization and Leadership	JamesG	0.00	0.00		\$0
Ed Organization and Leadership	Rutharfo	0.00	0.00		\$63,308
Ed Organization and Leadership	Ulysses	0.00	0.00		\$44,543
Ed Organization and Leadership		0.00	0.00		\$10,927.37
Educational Policy Studies	BenjaminHarrison	2.00	0.00		\$188,979
Educational Policy Studies	ChesterArthur	0.00	0.00		\$40,701
Educational Policy Studies	GrowerCleveland	0.00	0.00		\$0

Metrics



UNIVERSITY OF ILLINOIS
URBANA-CHAMPAIGN • CHICAGO • SPRINGFIELD

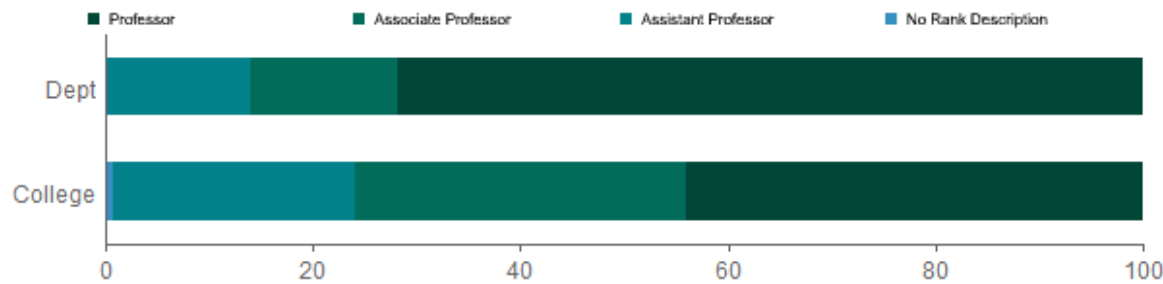
Metrics: Faculty Activity

Select Fall/Spring Hours Type Credit Hours Contact Hours Select Tenure Status All Tenure/Tenure Track

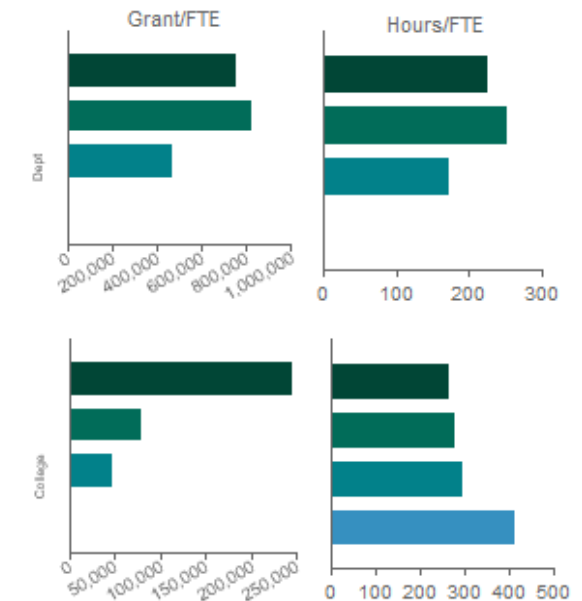
Productivity Overview Trends Sponsored Research vs Teaching Salary vs Teaching

Sample Page

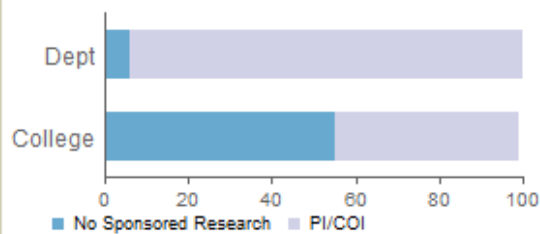
% FTE by Rank



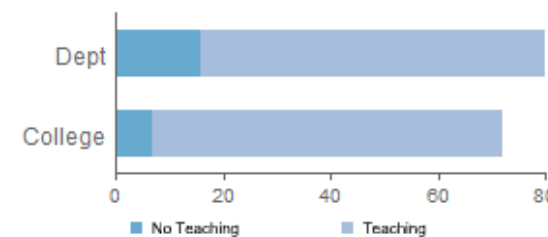
Grant/FTE and Hours/FTE



% PI/CoI vs Not

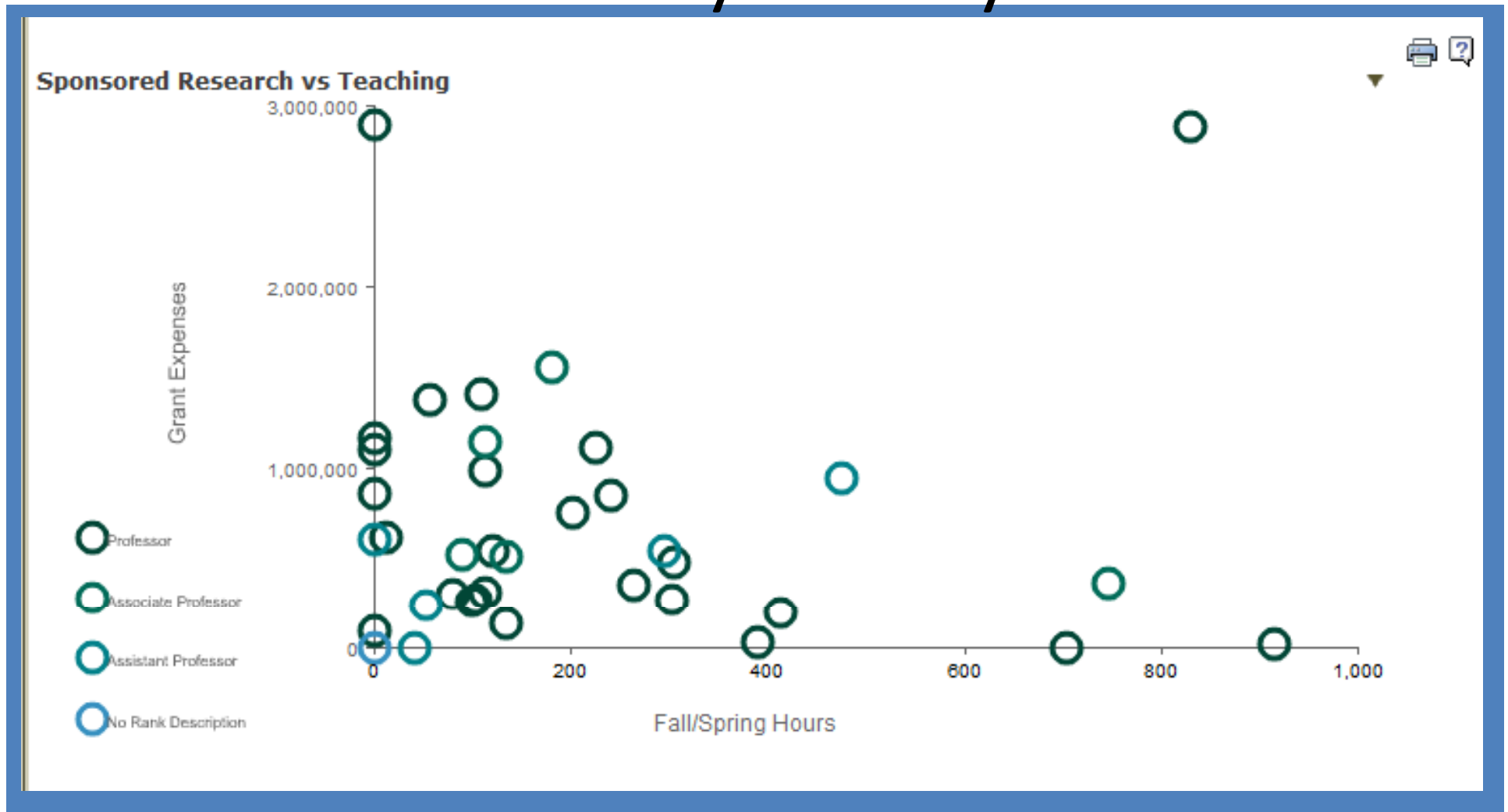


% Teaching vs Not

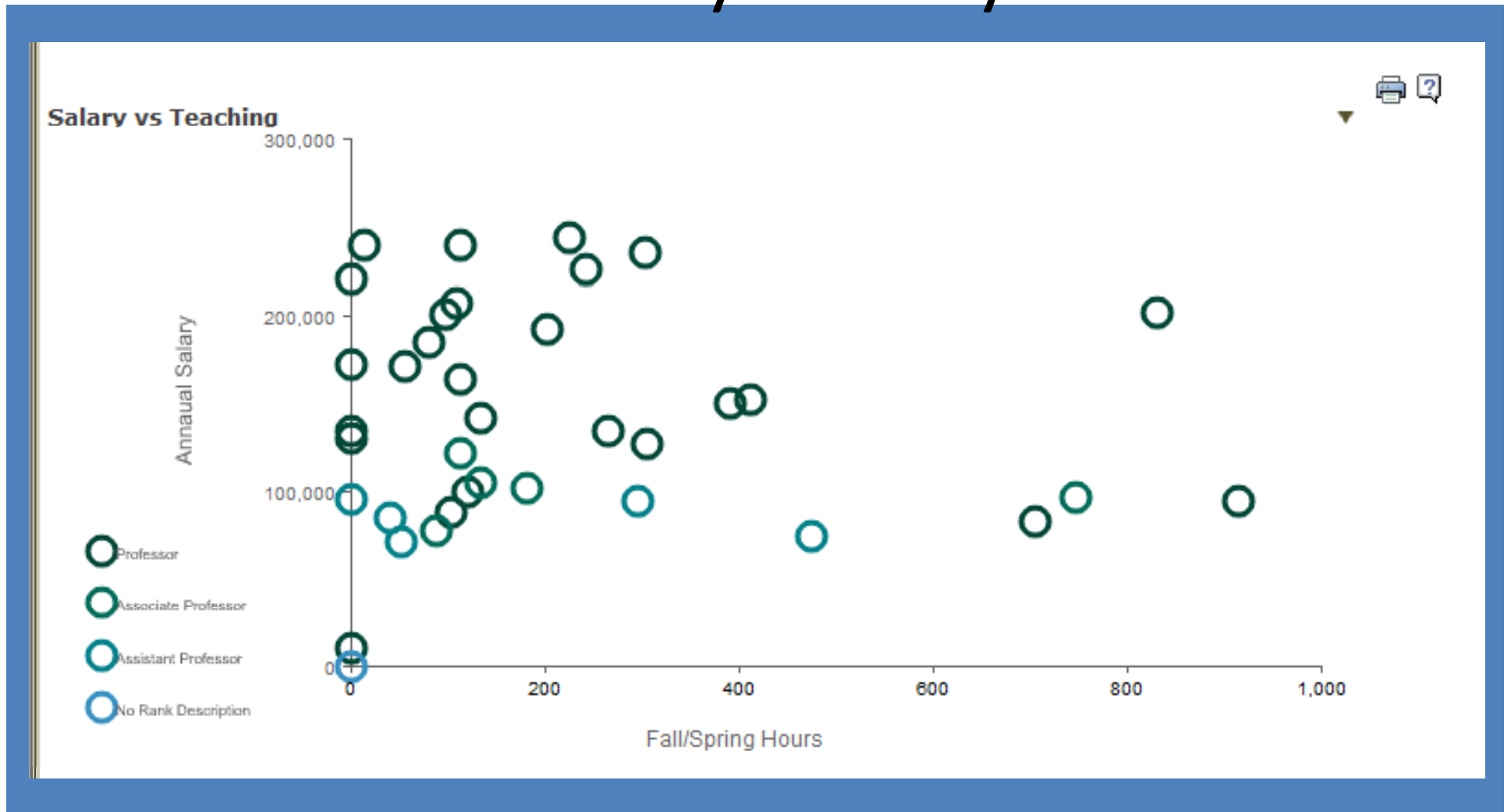


What am I looking at? Comparisons between your department and college.
 What am I looking for? - What is the FTE mix for this department and how does it compare to the college overall?
 - Are a greater or smaller proportion of faculty for this department teaching than for the college overall?
 - How is the teaching and sponsored research load divided between full, associate and assistant professors, and with non-tenure track faculty?

Metrics: Faculty Activity



Metrics: Faculty Activity



DISCUSSION QUESTION

What are the best practices in decision support?

What should be the mission, values and goals of a decision support function or organization?

15
minutes

THE ART AND SCIENCE OF COMMUNICATING DATA: INFORMATION DESIGN + DATA VISUALIZATION TRENDS AND PRACTICES

Holly Goodson

Chief Data Officer and Director

Institutional Research

Georgia Health Sciences University

The Art + Science of Communicating Data

INFORMATION DESIGN AND DATA
VISUALIZATION TRENDS + PRACTICES





[iris home](#) → [facts and figures](#) → [students](#) → fall enrollment trends by school

[related links](#) / [enrollment by race](#) / [enrollment by gender](#) / [legal residence](#)

Fall Enrollment Trends by School

[excel spreadsheet](#)

	1997	1998	1999	2000	2001
Allied Health Sciences	429	390	338	323	456
Dentistry	218	225	225	225	219
Graduate Studies	335	406	412	378	216
Medicine	712	716	712	711	719
Nursing	326	316	287	292	324
Other	7	13	5	2	5
Total Enrollment	2,027	2,066	1,979	1,931	1,939

NOTE: Enrollment figures displayed on this page do not include [residents](#).

SOURCE: Office of the Registrar

planning

assessment

reports

facts and figures

academics

applicants

employees

faculty

finance

graduates and alumni

research

residents

students

mcg's impact

about oiri

Search IRIS



Shortcuts

Handheld IRIS



IRIS: GHSU Facts and Figures

Data Categories

- Applicants
- Students**
- Residents
- Graduates
- Alumni
- Enterprise Workforce
- Faculty
- GHSU Staff
- Research
- Finance
- Downloads
- IRIS to Go
- Fact Sheets
- Maps
- Related Links
- Institutional Effectiveness
- Data Request Form
- Peer Institutions List
- IRIS Update Calendar

Share |    

IRIS: GHSU Facts and Figures

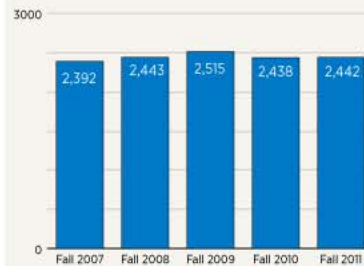
1120 15th Street
Augusta, GA 30912
706-721-2704

Institutional Information
IE@georgiahealth.edu

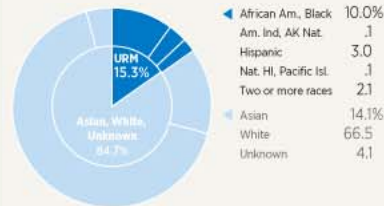
Students

GRAPHS

Total Student Enrollment



Students by Race



SUMMARY

From Georgia

88.2% Of Fall 2011 students were from Georgia

Online Enrollment

105 GHSU students enrolled in the electronic campus

Medicine

852 Fall 2011 students were enrolled in Medicine

Female Students

63.6% Of Fall 2011 Students were Female

TABLES

-  Fall Enrollment By Degree  Excel Archive
-  Fall Enrollment by Discipline  Excel Archive
-  Fall Enrollment by Gender  Excel Archive
-  Fall Enrollment by Race and Degree  Excel Archive
-  Fall Enrollment by Campus  Excel Archive
-  Fall 2011 On-Campus Housing  Excel Archive
-  Fall 2011 Legal Residence  Excel Archive
-  Fall 2011 Place of Origin  Excel Archive
-  Fall Enrollment by Georgia County Origin  Excel Archive
-  Fall Enrollment by College  Excel Archive
-  Fall Enrollment by Enrollment Status  Excel Archive
-  Retention Rates First Year Students 2009-10  Excel Archive

IRIS Student Enrollment - 2012

Carte Figurative des pertes successives en hommes de l'Armée Française dans la Campagne de Russie 1812-1813.

Revue par M. Misset, Inspecteur Général des Ponts et Chaussées en retraite. Paris, le 20 Novembre 1869.

Les arabes d'hommes peints sont représentés par les longueurs des zones colorées à raison d'un millimètre pour dix mille hommes; ils sont de plus écrits en traces des zones. Le rouge désigne les hommes qui entrent en Russie, le noir ceux qui en sortent. — Les renseignements qui ont servi à dresser la carte ont été puisés dans les ouvrages de M. de Chateaubriand, de Fozzard, de Chambray et le journal inédit de Jacob, pharmacien de l'Armée depuis le 25 Octobre.

Leur mieux faire juger à l'œil la diminution de l'armée, j'ai supposé que les corps du Lieutenant Général et du Maréchal Davout, qui avaient été détachés sur Kowno et Mielnik et qui rejoignirent l'armée à Wilna, avaient toujours marché avec l'armée.

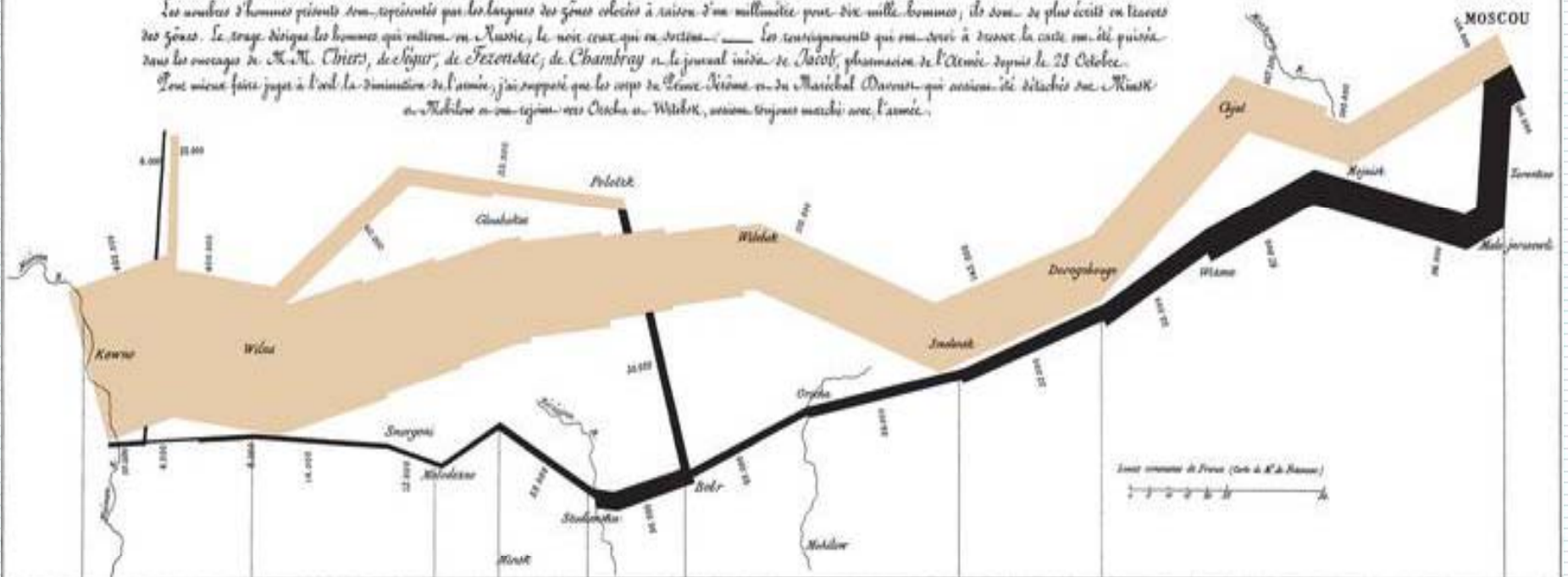
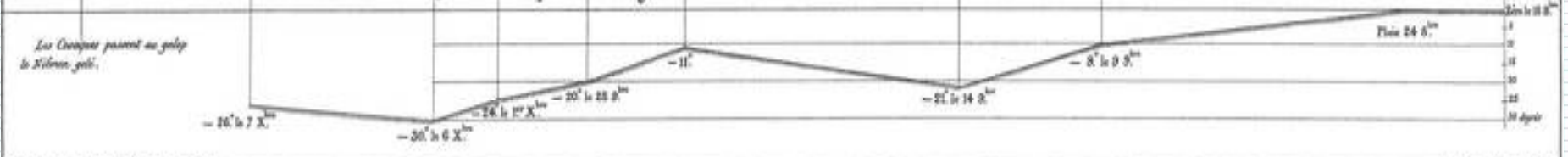


TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.



Atlas par Rayon, à Paris, le 27 Mars 1813.

Dep. 241. Rayon et Direction.

DATA VISUALIZATION

Murder in America - WSJ.com

projects.wsj.com/murderdata/#view=all

Murder in America

Explore an interactive database of killings committed in the U.S. from 2000 to 2010. You can sort by the race and sex of killer and victim, the circumstances of the killing, and many more variables. Click on a few sample searches to the right. Or watch a short video showing you how to use this app. Full Methodology here.

Select variables below to narrow your search.

Reset all values »

What

- Homicides

Who

Victim

- Race
- Sex
- Relationship (Victim to killer)

Killer

- Race
- Sex

How

- Using weapon:

When

- Select a year:

SAMPLE SEARCHES Here are some examples to get started:

- Victim: Black Male
Weapon: Firearm
- Location of murders: Texas
Circumstances: "Brawl due to influence of alcohol."
- Location of murders: Arizona
Circumstances: "Felon killed by police."
- Location of murders: Illinois
Circumstances: "Juvenile gang killings."
Weapon: Firearm.
- Circumstances: "Lover's triangle."
Method: "Pushed/thrown out window."

165,068 murders between 2000-2010 in all states except Florida

Like Tweet +1 35

Victims

Race

Age

0-17 years old	14,306
18-39	99,853
40-64	38,603
Over 65	7,017
Age unknown	5,289

Sex

Killers

Race

Age

0-17 years old	10,618
18-39	93,277
40-64	22,411
Over 65	2,193
Age unknown	60,874

Sex

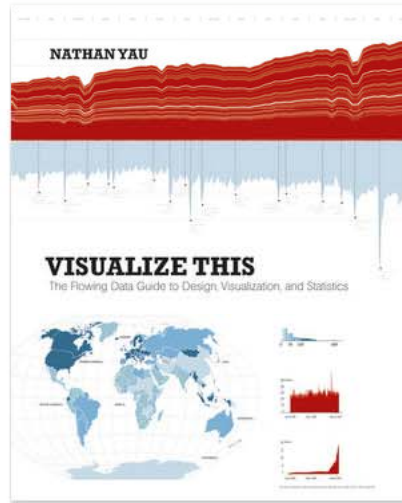
Wall Street Journal Murder Database

<http://projects.wsj.com/murderdata/>

VISUALIZE THIS

The FlowingData Guide to Design, Visualization, and Statistics

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Order *Visualize This*

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[BARNES & NOBLE.com](#)
www.bn.com

[WILEY](#)

About

A book by [Nathan Yau](#) who writes for [FlowingData](#), *Visualize This* is a practical guide on visualization and how to approach real-world data. The book is published by Wiley and is available on [Amazon](#) and other major online booksellers.

There are lots of books on visualization that describe best practices and design concepts, but what do you do when it comes time for you to actually make something?

TABLE OF CONTENTS

[Introduction](#)

[Chapter 1 — Telling Stories with Data](#)

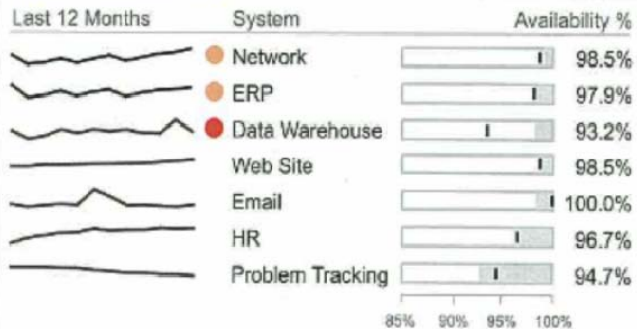
Visualize This! by Nathan Yau

<http://book.floodingata.com/>

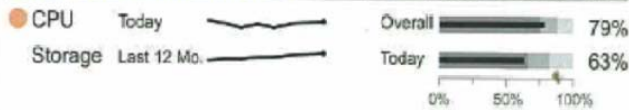
Now Network ERP Data Warehouse Web Site Email

CIO Dashboard (As of December 19, 2004, 3)

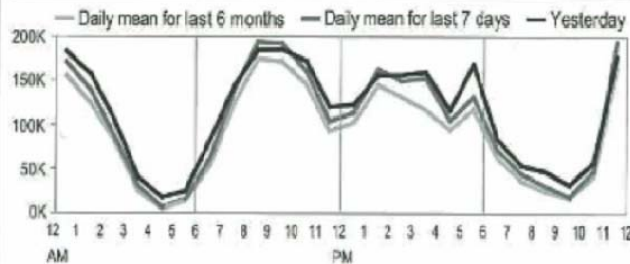
System Availability (Last 30 days) (Actual; Acceptable)



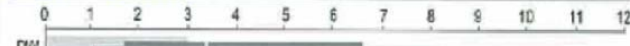
Hardware % of Capacity (Actual; Good; Excessive; Critical)



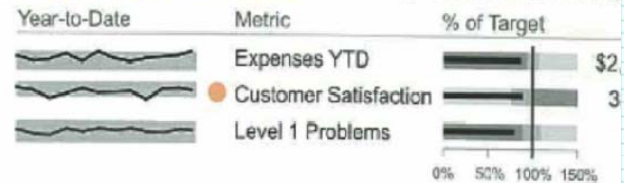
Daily Network Traffic (Kilobytes)



Response Time (Distribution in seconds) (Acceptable)



Key Non-System Metrics (Actual; Good; Excessive)



Major Project Milestones

Project	Milestone	Due Date	Date
ERP Upgrade	Full system test	01/10/06	
Add services data to DW	ETL coding	12/15/05	
Upgrade mainframe OS	Prepare plan	12/23/05	
Disaster recovery site	Install hardware	01/08/06	
Budgeting system	Hire team	12/06/05	
Web site face-lift	Move into production	01/05/05	

5 Top Projects in the Queue (Sorted by priority)

Project	Status	Funding Approved
1 Professional services module	Pending available staff	X
2 Upgrade MS Office	Cost-benefit analysis	
3 Failover for ERP	Preparing proposal	
4 Upgrade data warehouse HW	Evaluating options	X
5 Executive dashboard	Vendor assessment	

Critical Events (Next 14 Days)

Event	Group Responsible	Date
Full system maintenance outage from 9-11 PM	G. Jones	1
Present hardware upgrade proposal to CEO	Self/M. Smith	1

DASHBOARDS

A dashboard is a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged on a single screen so the information can be monitored at a glance.

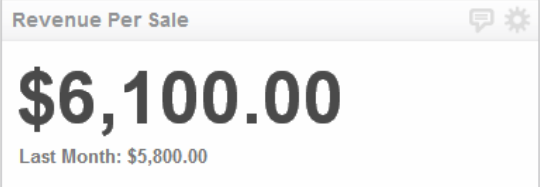
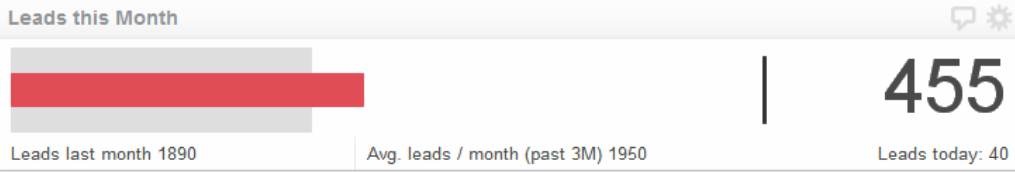
-- Stephen Few
Analytical Design Master

+ Add a Klip Layout



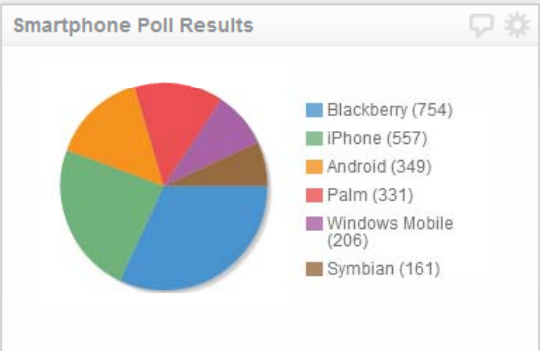
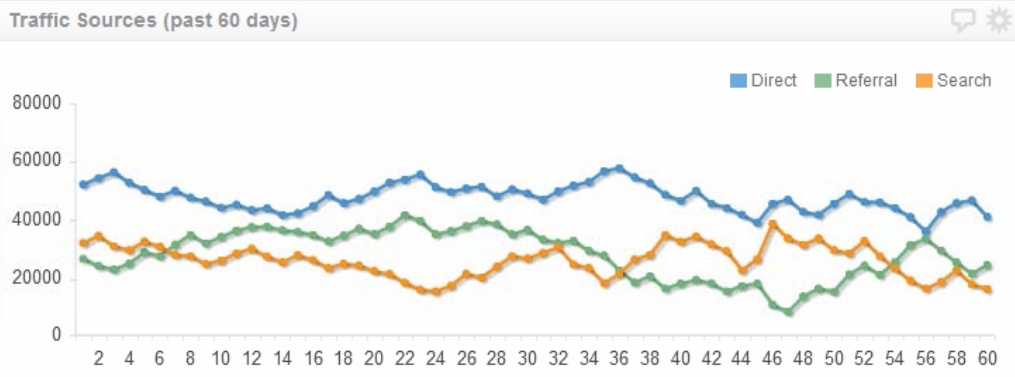
Funnel

Metric	On Target	Past 30 ...	60 - 90 ...
Visits	3%	67,875	64,874
Downl...	9%	23,092	19,456
Leads	54%	3,434	3,845
Opps	26%	197	157
Wins	-8%	112	120



Campaign Performance

Campaign	ROI	Leads	Wins	Start
★ 01/09 Email Blast	-18.45%	▼ 1,214	▼ 2	Thu, Apr 01, 2010
★ Blue Team Video	-8.73%	▲ 325	▲ 42	Mon, May 10, 2010
★ Red Team Skyscraper	11.05%	▬ 235	▬ 58	Wed, May 12, 2010
★ Red Team Banner	33.88%	▲ 512	▲ 121	Sun, Apr 04, 2010
		2,286		



The Dashboard Spy

- About
- The Dashboard Spy List of Experts
- Privacy Policy for dashboardspy.com

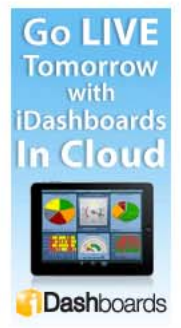
Business Dashboard Of The Day

Click here to see a random dashboard example:

[Dashboard Example](#)

Recommended Dashboard Resources

Suggested Services and Resources from The Dashboard Spy:



Home » Archive by category 'Dashboards' (Page 4)

Digital Dashboard from the Wall Street Journal Network



Easy Dashboard Software

Quick & Easy Dashboard Software. Tableau 7 is Here. Try Free Now!
www.TableauSoftware.com/Dashboard AdChoices

Visit the digital dashboard from the Wall Street Journal Digital Network and you'll see how it makes use of hover over events to surface data in a very easy-to-use manner. By simply hovering over a section of the dashboard or the red/green indicators on the right, we get a "fly-out" kind of effect with corresponding data.

You can get some indication of the effect in this dashboard screenshot, but you'll have to visit the dashboard yourself to really get how the navigation works. Take a look at this image and I'll drop the link below it.

Global Dow Realtime USD
 GDOW 1809.17 ▲
 Change 7.3 / 0.40%
 Previous Close 1801.87
 52 week low 1779.16 52 week high 2270.47
 11:47 PM 09.06.11

Markets:
 New York Closed London Closed Tokyo Holiday

Major Indexes:

DJI	Nasdaq	S&P 500
-0.89%	-0.26%	-0.74%
0.40%	1.06%	1.44%
Global Dow	FTSE100	Nikkei
66%	29%	

Treasury Bonds:

4.0%	16.3%	3.90%
3 month	6 month	2 year
3.05%	2.63%	1.71%
5 year	10 year	30 year

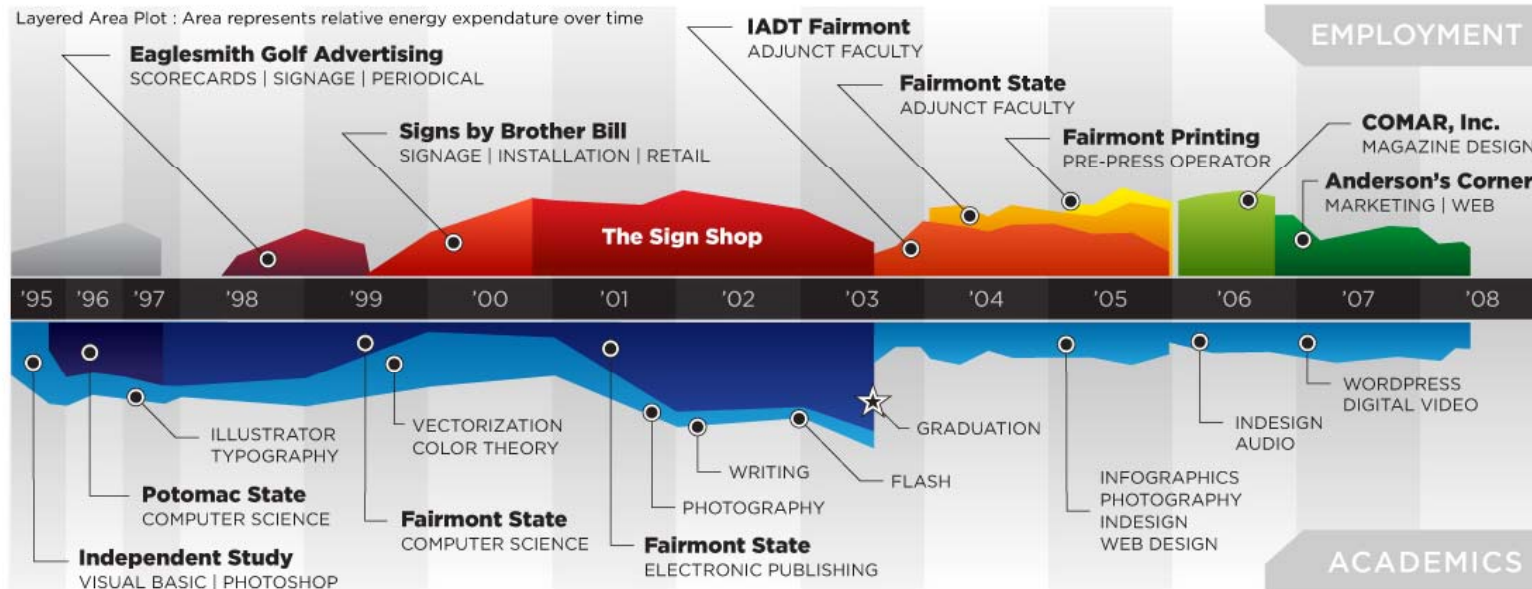
Currencies & Gold:

0.16%	0.39%	0.25%
Gold	Euro/USD	GBP/USD
-0.64%	-0.13%	-0.54%
USD/ Yen	USD/ Can	USD/ Swiss

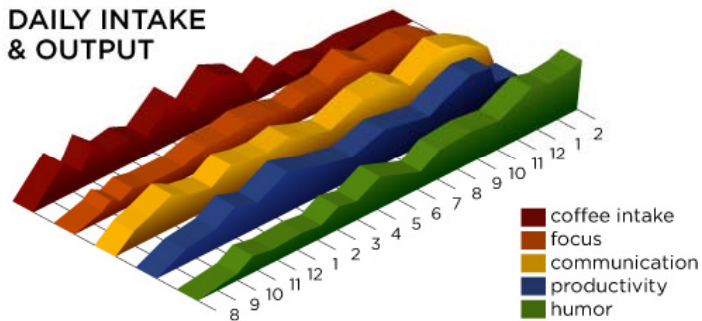
Tag Cloud:

- 10 WAYS TO BEGIN A DATA WAREHOUSE PROJECT
- 10 WAYS TO START A DATA WAREHOUSING PROJECT
- 2011 GARTNER MAGIC QUADRANT FOR BUSINESS INTELLIGENCE PLATFORMS
- ACTION DASHBOARD ANDROID DEVELOPERS DASHBOARD ANYCHARTS DASHBOARD AVINASH KAUSHIK DASHBOARDS BAFFLING FLOW CHART BALANCED SCORECARD BALANCED SCORECARDS BANKER DASHBOARD BANKERS DASHBOARD BILL GATES DASHBOARD BILLION POUND-GRAM
- BITS ON THE RUN DASHBOARD** BOTR
- DASHBOARD BUSINESS DASHBOARD COST BUSINESS DASHBOARD INITIATIVES BUSINESS DRIVERS FOR DASHBOARDS BUSINESS INTELLIGENCE MAPS BUSINESS INTELLIGENCE NEWSLETTER BUSINESS INTELLIGENCE WHITE

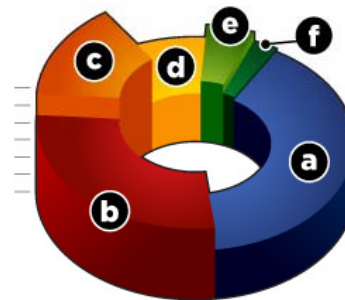
Dashboard Spy
<http://dashboardspy.com/>



DAILY INTAKE & OUTPUT



PRIMARY SKILL SETS



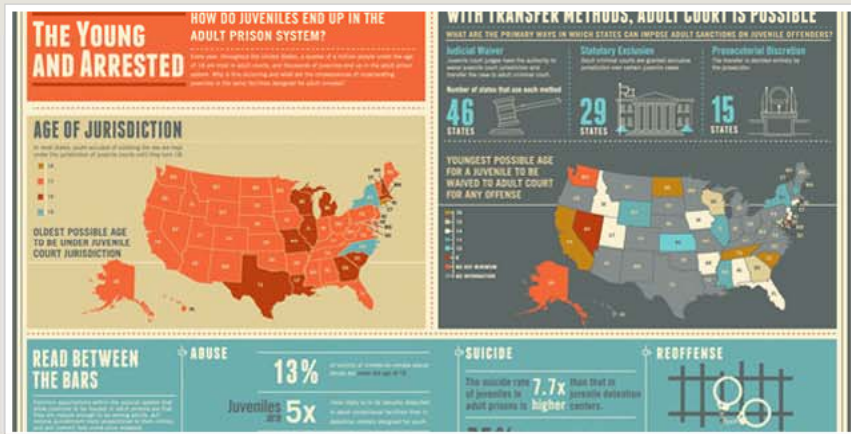
- a.** Digital Photography, *Photoshop*
- b.** Layout, *InDesign*, Typography
- c.** *Illustrator*, Vectorization, Signs
- d.** *Flash*, Animation, Scripting
- e.** Web Design, Wordpress, CSS
- f.** Copywriting, Editing, Research

Pie slice = represents % personal time investment. Height indicates approx. professional deployment.

INFORMATION GRAPHICS

GOOD INFOGRAPHICS

- NEWS
- BUSINESS
- CULTURE
- DESIGN
- LIFESTYLE
- TECHNOLOGY
- INFOGRAPHICS
- VIDEOS
- PROJECTS

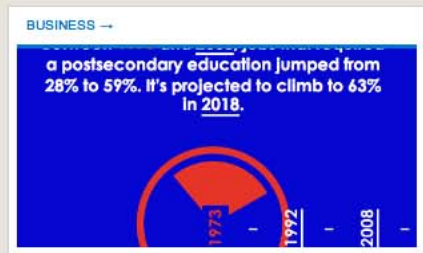


CULTURE →

Infographic: How Do Juveniles End Up in the Adult Prison System?

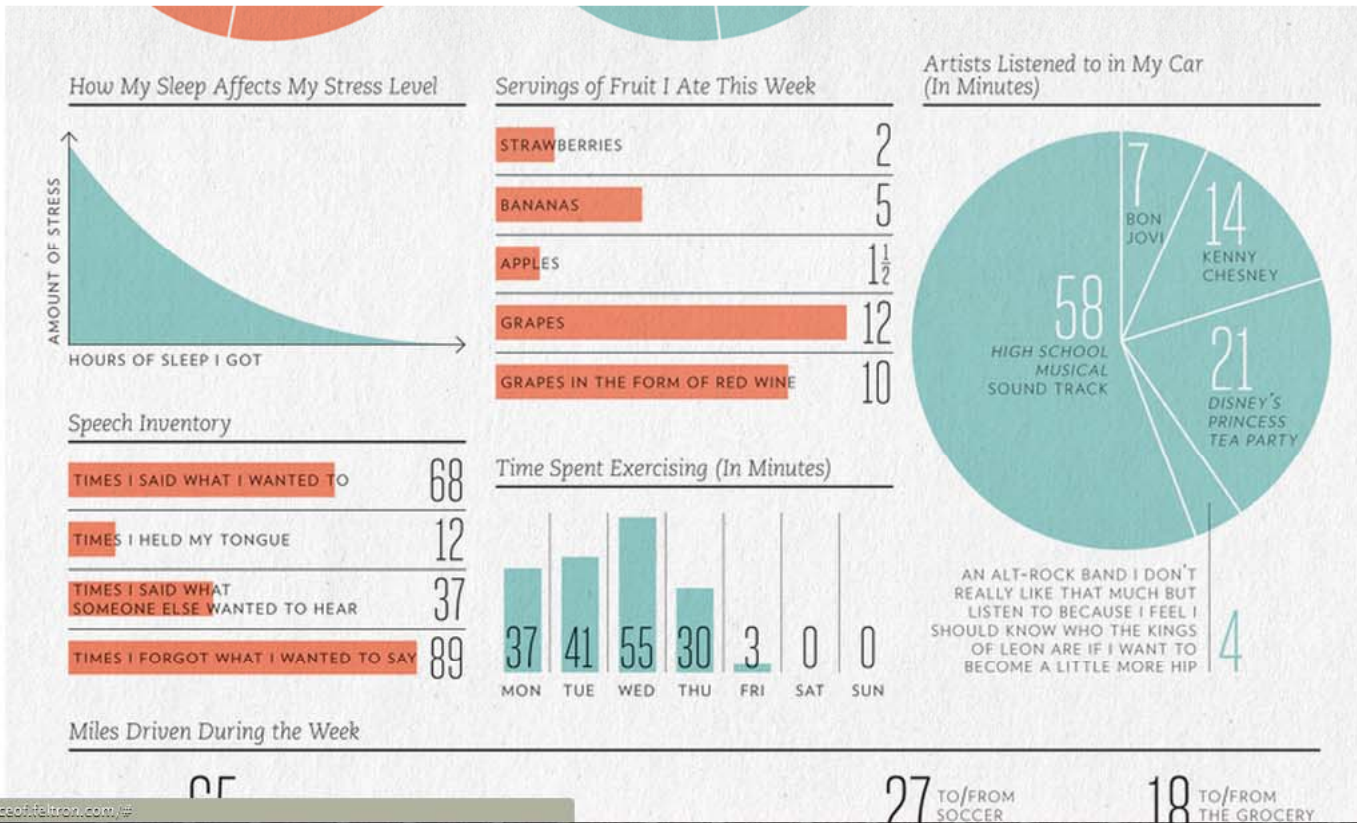
by COLUMN FIVE MEDIA

- RECENT
 - POPULAR
 - ALL TIME
- RSS



Real Simple

PREVIOUS / NEXT IMAGE (2 OF 2)



Nicholas Felton

<http://www.feltron.com>

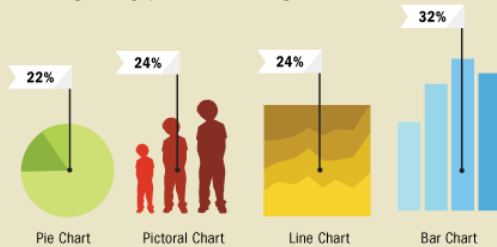
INFOGRAPHIC OF INFOGRAPHICS

Data visualization is a popular new way of sharing research. Here is a look at some of the visual devices, informational elements, and general trends found in the modern day infographic.

DESIGN

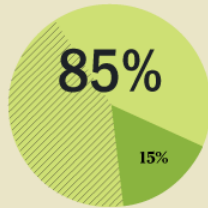
CHART STYLE

Percentage of infographics with the following charts:



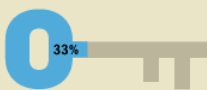
FONT

■ Sans Serif
 Condensed Sans Serif
 ■ Serif



KEY INFO

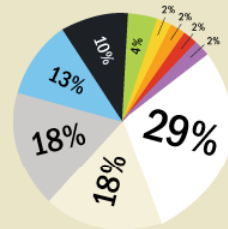
Percentage of infographics with key:



Average number of symbols per key: 5.1

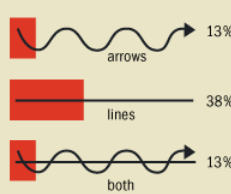


BASE COLOR



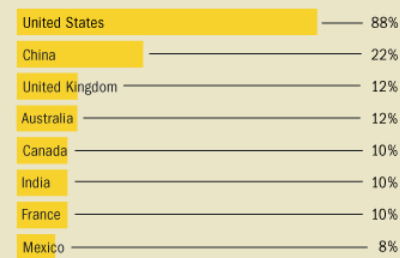
NAVIGATIONAL ICONOGRAPHY

Frequency of arrows & connecting lines in infographics:



CONTENT

COUNTRIES FEATURED

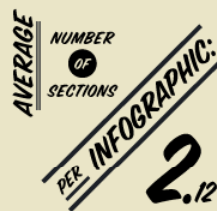


THEME

Relative popularity of different infographic themes:



SECTIONS



CREDITED SOURCES

Average number of sources per infographic: 2.29



TITLE

Average number of words per infographic title: 4.36

“RICHEST AND POOREST AMERICAN NEIGH

CONCEPT & DESIGN Ivan Cash

SOURCE 49 infographics collected at random from www.good.is/infographics

Infographics of Infographics

<http://ivancash.com/Infographic-of-Infographics>

HEALTH DISPARITIES IN GEORGIA: AN ANALYSIS

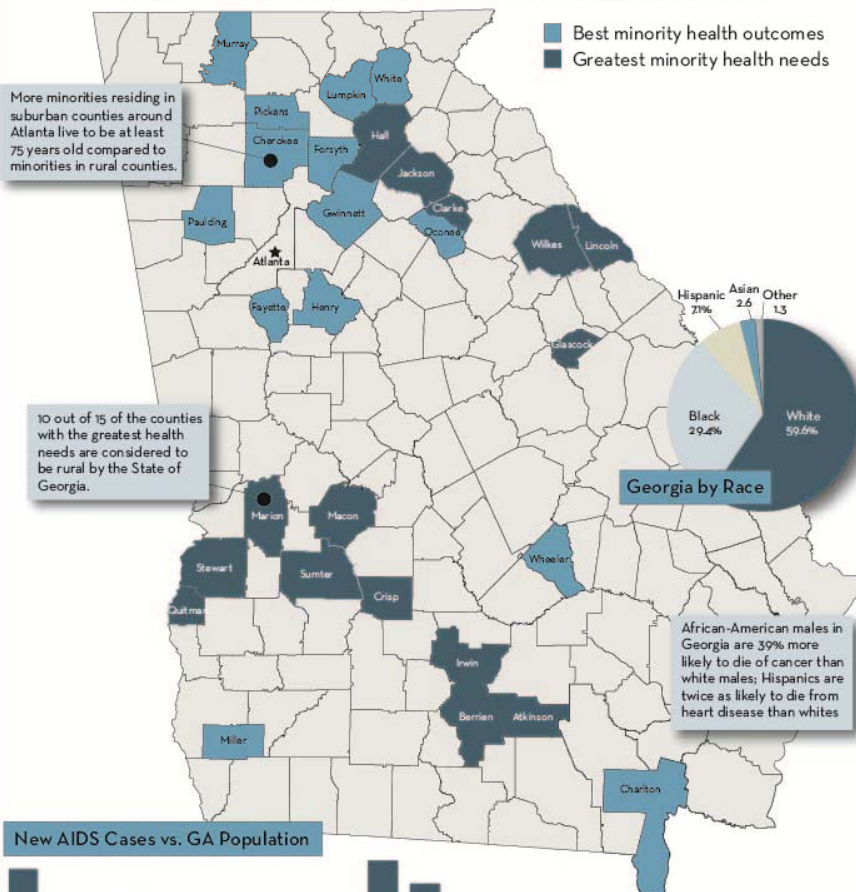
WHAT ARE HEALTH DISPARITIES?

Health disparities are differences in the incidence, prevalence, mortality, and burden of cancer and related adverse health conditions that exist among specific population groups in the US.

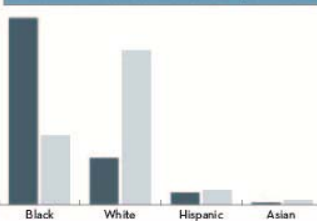
VULNERABLE POPULATION GROUPS

Population groups vulnerable to health disparities are categorized by race and ethnicity, gender, age, social class, income, education, geography, disability, and sexual orientation.

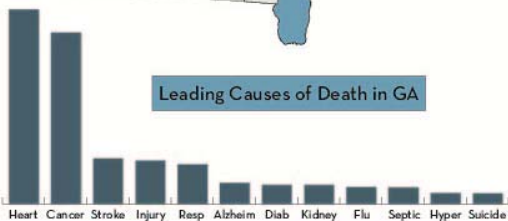
Which Georgia counties have the greatest health disparities?



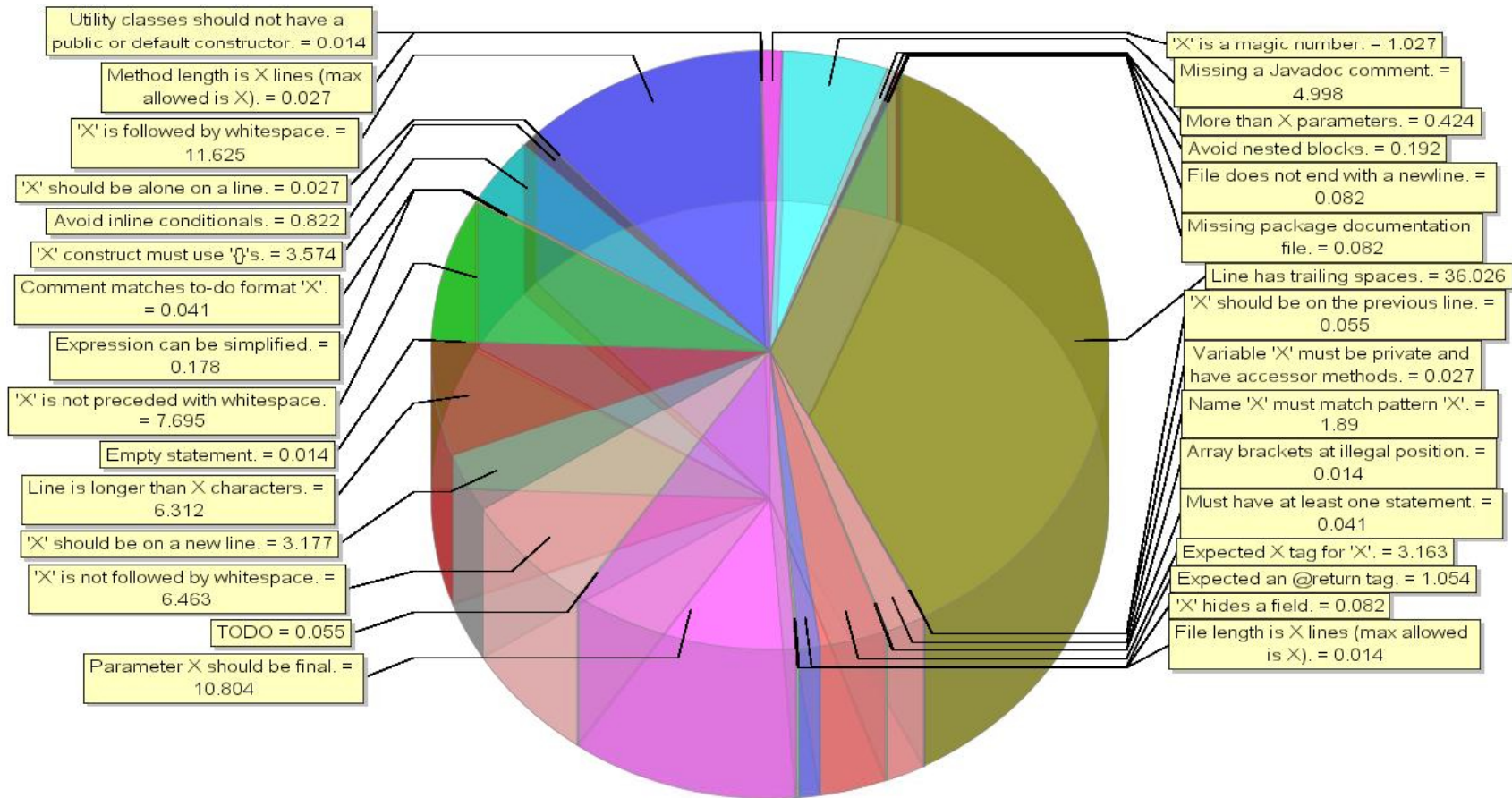
New AIDS Cases vs. GA Population



Leading Causes of Death in GA



Health Disparities in Georgia: An Analysis



GOOD VS. BAD DATA DESIGN

Juice Labs - Chart Chooser
 labs.juiceanalytics.com/chartchooser.html

Viewing 17 of 17
 All Comparison Distribution Composition Trend Relationship Table
 For: Powerpoint Excel

Try interactive charts with...

Line chart

Bar chart

Stacked bar chart

Bullet bar chart

Column chart

Stacked column chart

Pie chart

Pie chart with highlight

Scatterplot chart

Bubble chart

Waterfall chart

Stacked column volume chart

Alternating rows table

Name	Age	Salary	Gender	City
John Doe	28	50000	Male	New York
Jane Smith	32	60000	Female	Los Angeles
Bob Johnson	25	45000	Male	Chicago
Alice Williams	30	55000	Female	San Francisco
Charlie Brown	22	40000	Male	London
Diana Prince	27	50000	Female	Paris
Frank Miller	35	65000	Male	Tokyo
Grace Lee	29	52000	Female	Sydney
Harry King	31	58000	Male	Auckland
Ivy Green	26	48000	Female	Wellington
Jack White	33	62000	Male	Christchurch
Karen Black	24	42000	Female	Dunedin
Leo Grey	34	68000	Male	Hamilton
Mia Blue	23	40000	Female	Wellington
Noah Red	36	70000	Male	Christchurch
Olivia Purple	21	38000	Female	Dunedin
Peter Yellow	37	72000	Male	Hamilton
Quinn Green	20	35000	Female	Wellington
Ryan Orange	38	75000	Male	Christchurch
Sarah Pink	19	32000	Female	Dunedin
Tom Brown	39	78000	Male	Hamilton
Uma Gold	18	30000	Female	Wellington
Victor Silver	40	80000	Male	Christchurch
Wendy Bronze	17	28000	Female	Dunedin
Xavier Iron	41	82000	Male	Hamilton
Yara Steel	16	25000	Female	Wellington
Zoe Copper	42	85000	Male	Christchurch

Stacked column volume with total chart

Two axis column line chart

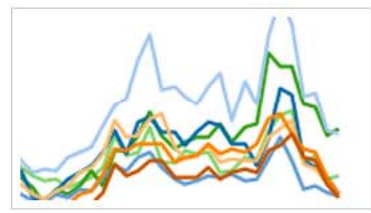
Chart Chooser

<http://labs.juiceanalytics.com/chartchooser.html>

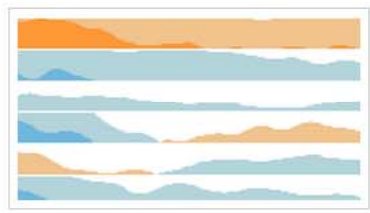


Visual Gallery

Beauty and brains. See what you can accomplish with Tableau.



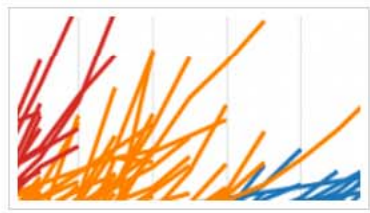
Real Estate Prices
What's happening with local real estate prices?



Employment Horizon Chart
Look at the unemployment rate across the country over time.



Storm Tracking
Storm seasons: measuring and tracking key indicators



Company Performance
Not all tech companies are rocket ships

INDUSTRY

Select All

- Business Services
- Consumer Goods & Services
- Education
- Government
- Healthcare & Medical
- Energy & Utilities
- Retail & Distribution
- Pharmaceuticals & Biotech
- Investment Services
- Transportation & Logistics
- Other

Tableau Software

http://www.tableausoftware.com/

Book1 - Microsoft Excel Preview

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW POWER VIEW DESIGN LAYOUT POWERPIVOT TEAM

Switch Visualization Tiles Slicer Options Number Text Arrange

Power View in Excel 2013

sort by deviceplatform ▼ asc

querydwelltime by deviceplatform

deviceplatform	querydwelltime (billions)
Android	1.2734
iPhone OS	1.3
proprietary development	26.23
RIM OS	6.2184
Unknown	2.136
Windows Phone	39.39K

state

United Arab Emirates United Kingdom **United States** Viet Nam

querydwelltime by devicemodel

devicemodel	querydwelltime (thousands)
7 Mozart T8698	~0.5K
7 Trophy T8698	~2.5K
7 Trophy T8686	~0.5K
CEPC	~0.5K
E600	~0.5K
GT-I8350	~0.5K
HD7	~5.0K
T9292	~2.5K
LG-C900	~0.5K
LG-E900	~3.5K
LG-E900h	~2.5K
Mazaa	~2.0K
mwp8985	~0.5K
NA	~0.5K
OMNIA7	~8.0K
PD67100	~0.5K
SGH-I917	~7.0K
SGH-I917R	~6.5K
T7575	~0.5K
T8697	~2.5K
T8788	~0.5K
T9295	~0.5K
Venue Pro	~0.5K
XDeviceEmulator	~0.5K

Power View Fields

ACTIVE ALL

- Query
 - clientid
 - country
 - devicemake
 - devicemodel
 - deviceplatform
 - market
 - querydwelltime
 - querytime
 - sessionid
 - sessionpagevieworder
 - state

Drag fields between areas below:

TILE BY

Σ VALUES
querydwelltime

AXIS
deviceplatform

LEGEND

VERTICAL MULTIPLES

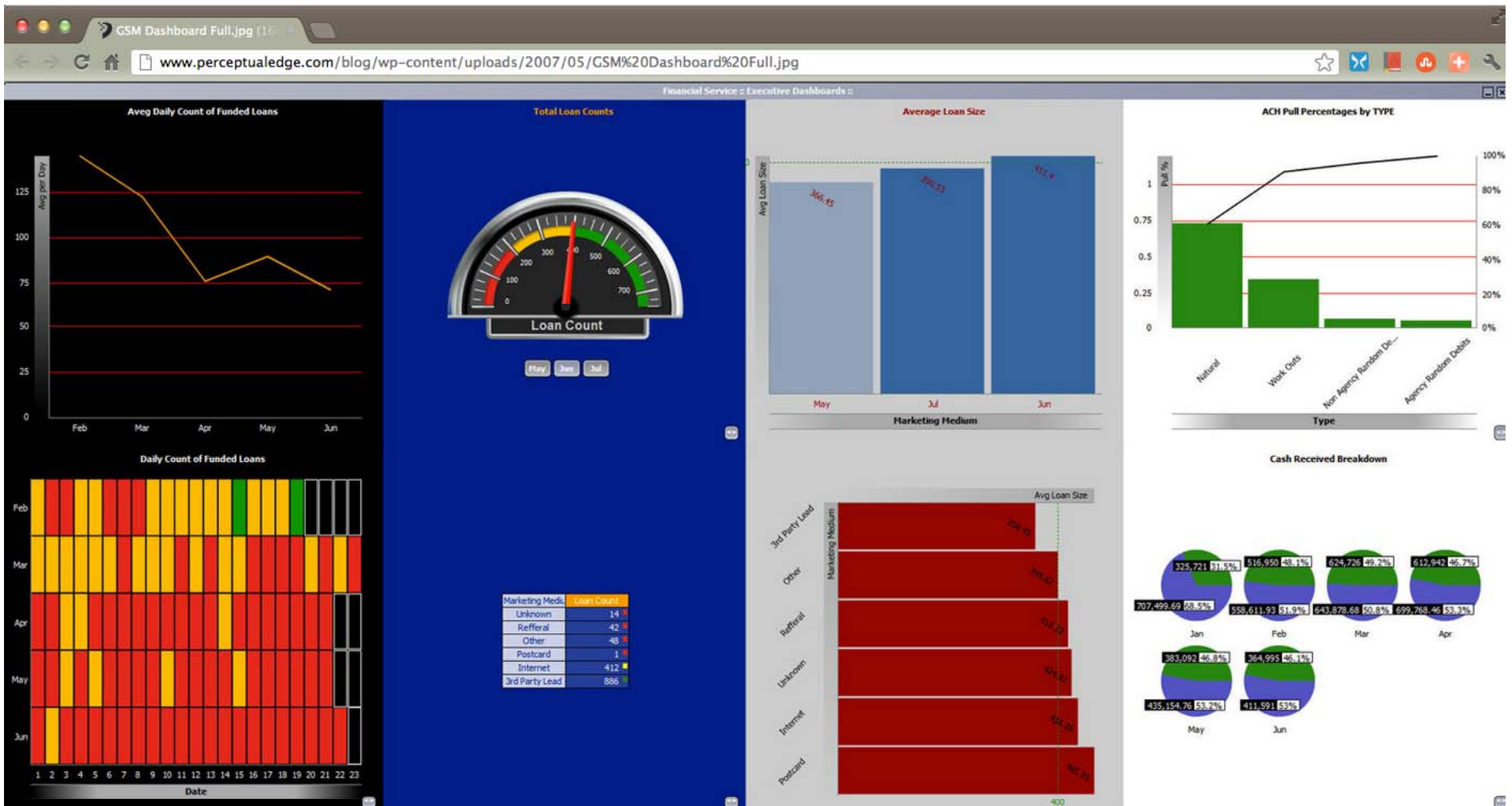
HORIZONTAL MULTIPLES

Sheet1 Power View1

READY

Microsoft Excel 2013 Chart Wizard

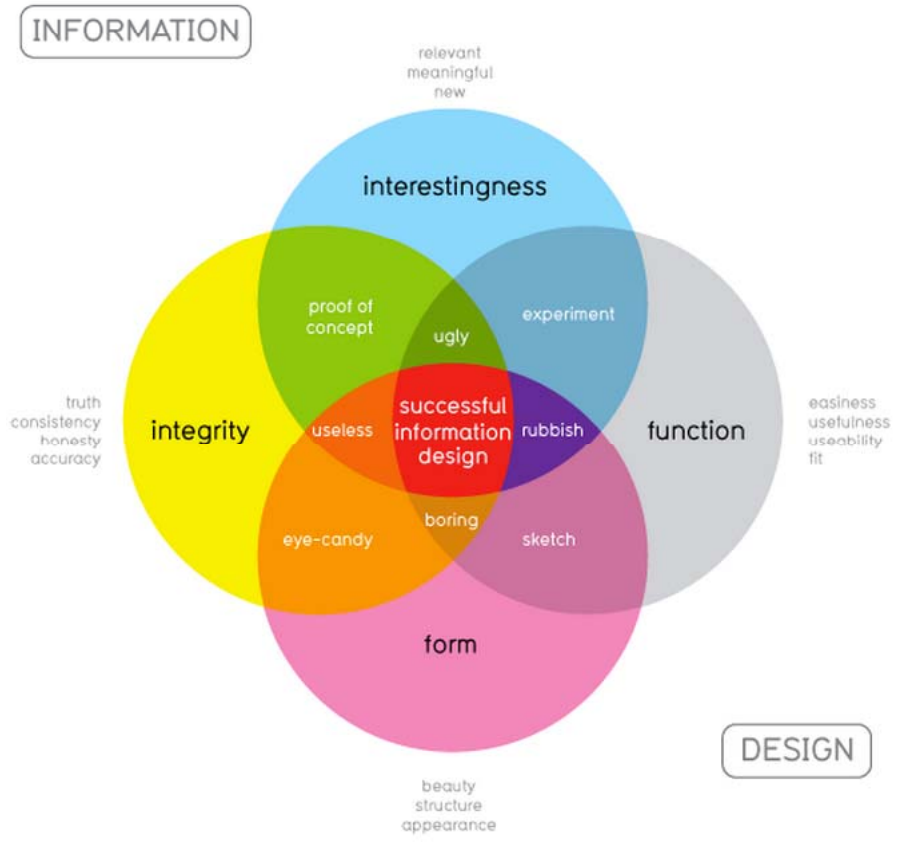
<http://www.microsoft.com/excel/>



Bad Dashboard Gallery/Perceptual Edge

<http://www.perceptualedge.com/>

What Makes Good Information Design?



David McCandless // v1.0 // Nov 09
InformationIsBeautiful.net

VALUE OF INFORMATION DESIGN

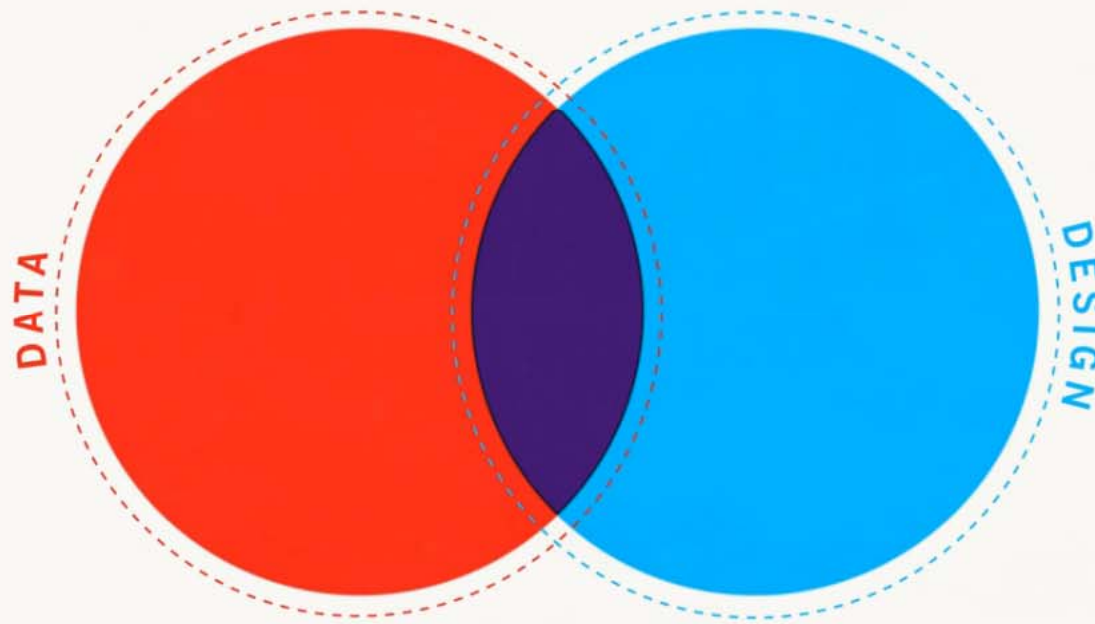


Internet in 60 Seconds

A year old and already outdated.

A commonality between science and art is trying to see profoundly - to develop strategies of seeing and showing.

-- Edward Tufte
Information Design Giant



The Value of Visualization

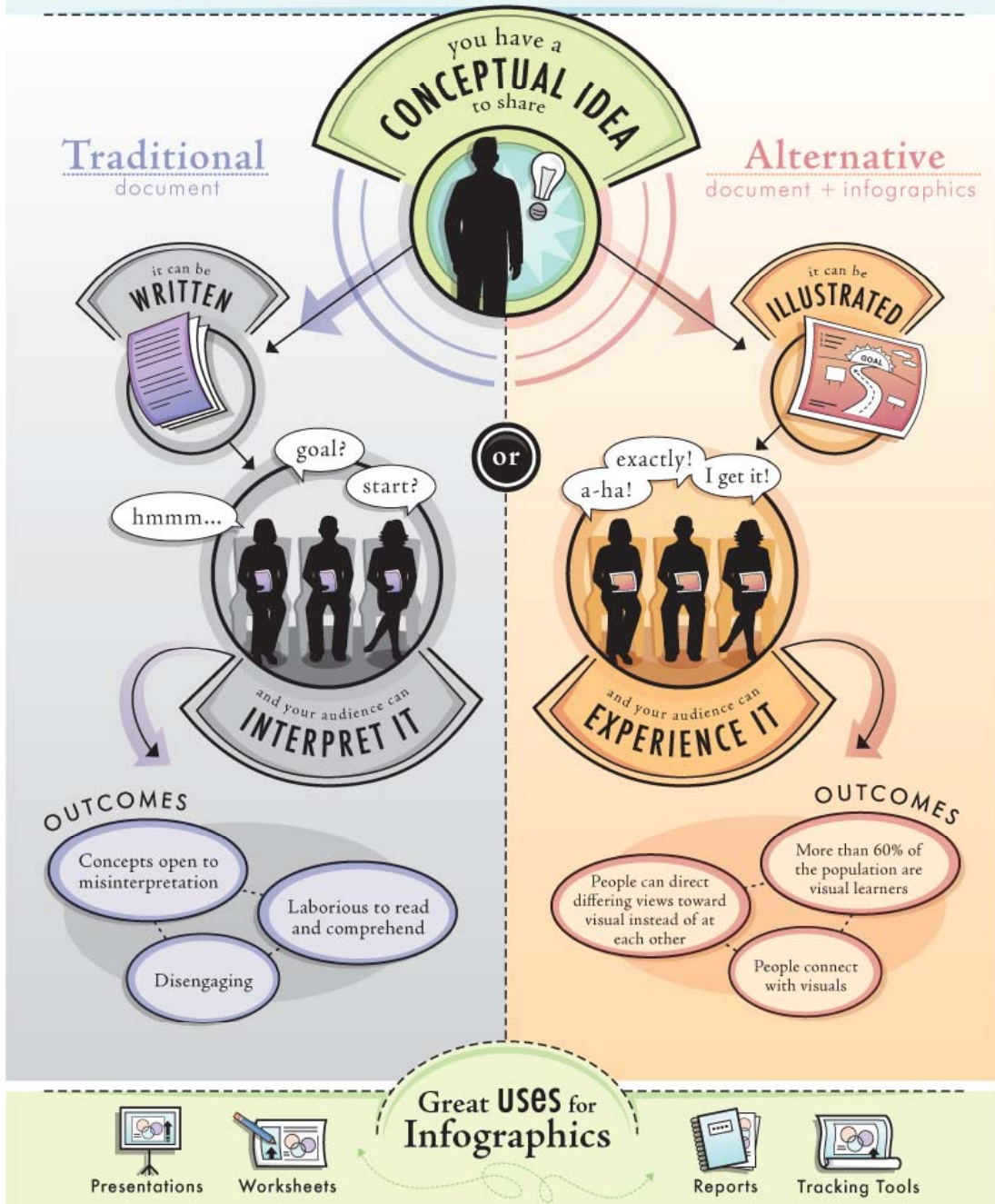
by Column Five PRO 11 months ago

The Value of Visualization

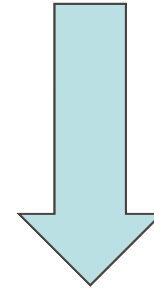
<http://columnfivemedia.com/the-value-of-data-visualization/>

Why Infographics

accelerate decision making



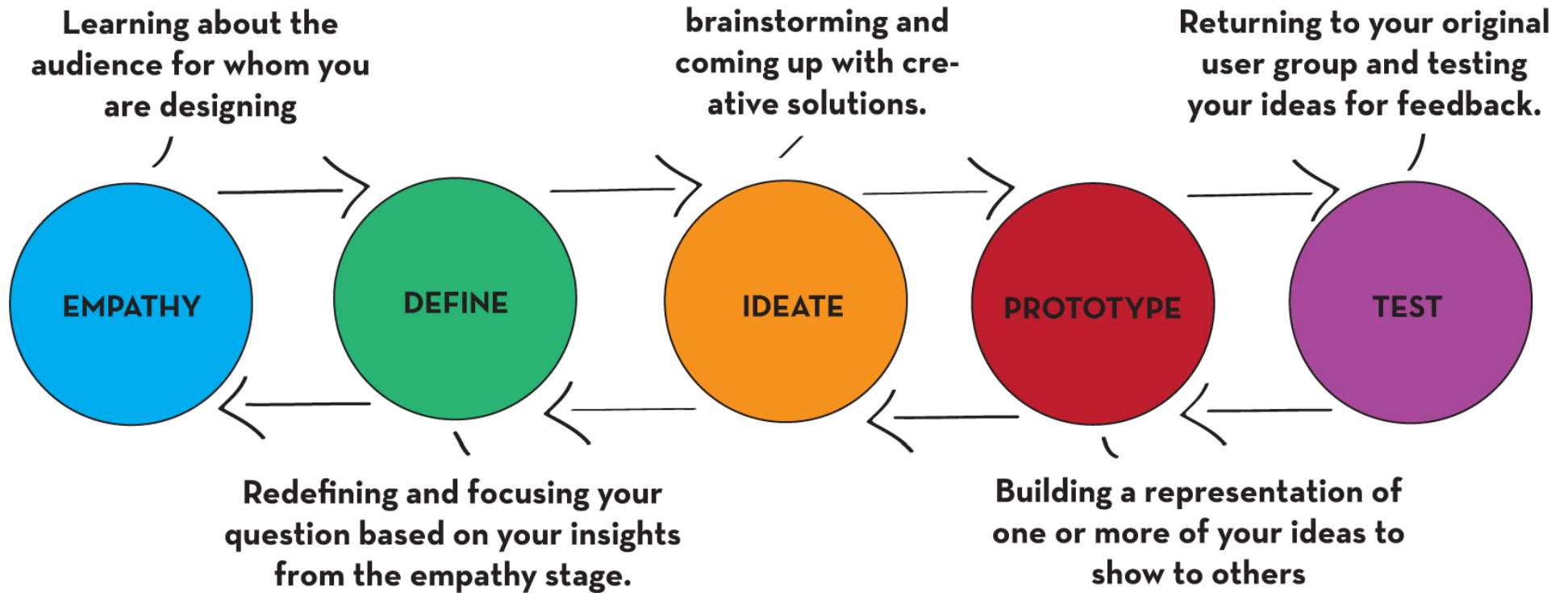
DESIGN



MEANING



CLARITY



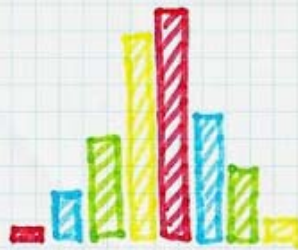
DESIGN THINKING

Because design thinking
balances the perspectives
of users, technology, and
business, it is by its
nature integrative.

-- Tim Brown
IDEO

Nuts and Bolts of Chart Types

Created by

HISTOGRAM

Chart used by responsible analysts who understand the power of segmentation and the sadness that comes from aggregating data.



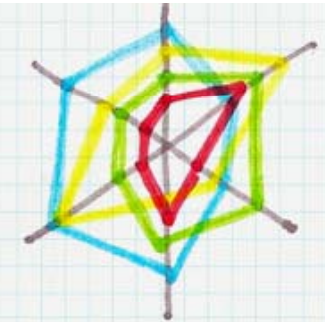
BAR CHART

Safe choice. But make sure you read Stephen Few before you show the chart to your boss, it will increase the probability of getting a raise.



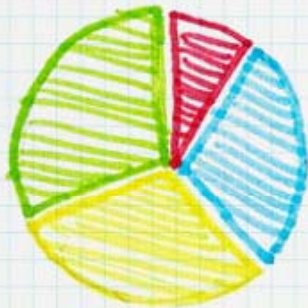
BUBBLE CHART

If you manage to extract insights from this graph your name is Hans Rosting.



RADAR CHART

If you want to build a complex model around which you have done a ton of research, that's your choice (but only PhDs will understand you).



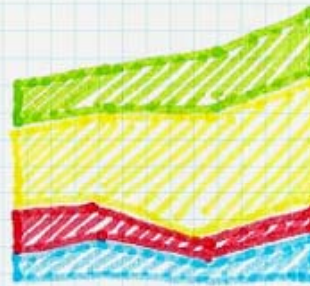
PIE CHART

Extremely useful when creating a well designed document that is intended to people that will not read the data (e.g. management)



LINE CHART

Useful to show trends, especially upwards (for downwards trends people tend to use more obscure charts, like the waterfall chart, see below)



AREA CHART

Please don't use this chart, I beg you! And please buy one of Tufte books.



TREE MAP

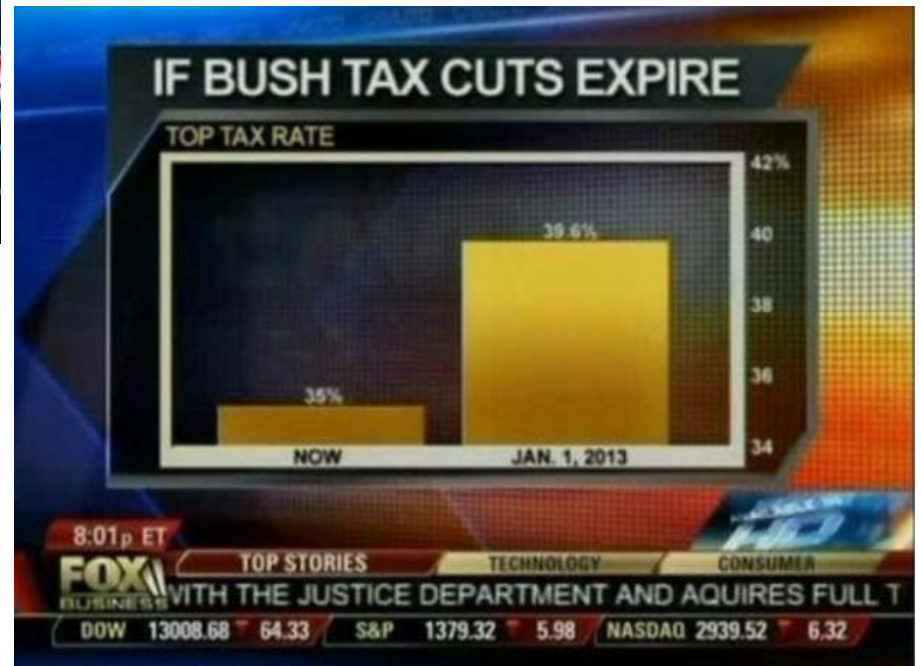
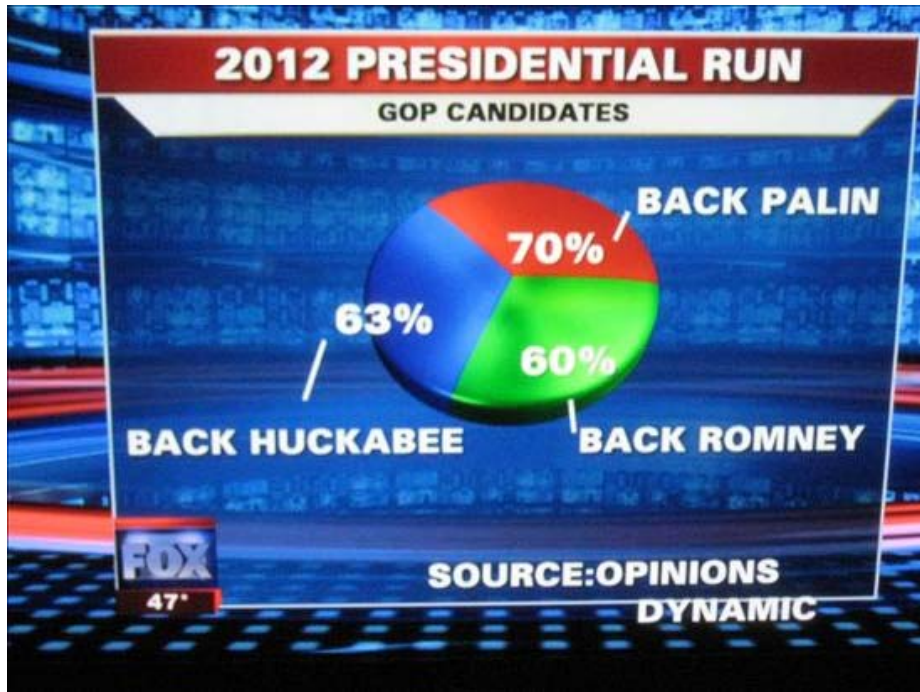
I have seen trees and I have seen maps, but how exactly this map is a combination of both? If you use it, good for you.



SCATTERPLOT

Very useful to find outliers, just like the people that commonly create them: human beings that finished their PhD in math by the age of 16.

DATA DESIGN PRACTICES



Tell the truth!

Is the design **accurate**? Is the design appropriate for the **audience**?

The Opportunity Gap

The opportunity gap disproportionately impacts students of color who come from low-income backgrounds. The demographic inequalities Black and Hispanic students in the United States face in comparison to their White peers put them at a disadvantage before they even enter school. When combined with the educational disparities known as the achievement gap, students of color often have to overcome more challenges to have an equal chance at life's opportunities.

A collaboration between GOOD and Hyperakt, in partnership with University of Phoenix.

Sources

Poverty, Health Insurance & College Graduation
Pew Hispanic Center tabulations of 2009 American Community Survey.

Household Income
Children's Defense Fund Report, "Portrait of Inequality 2011: Black Children in America," 2011.

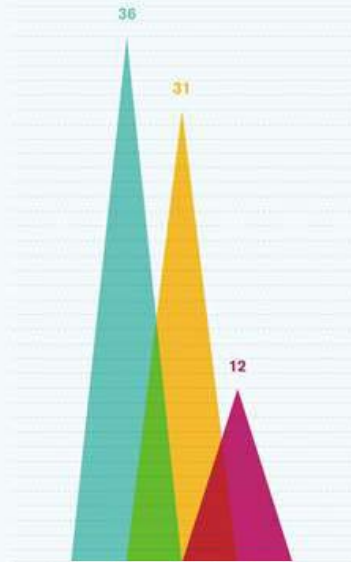
Infant Mortality
Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System, National Linked Birth/Infant Death Data Sets.

College Barriers
Institute for Higher Education Policy, "Promises Not Kept: College-qualified students who don't enroll in college," 2008, P. 14.

Pew Hispanic Center, "Latinos and Education: Exploring the Attainment Gap," 2008, P. 7.

Children's Defense Fund Report, "Portrait of Inequality 2011: Black Children in America," 2011.

GOOD + University of Phoenix



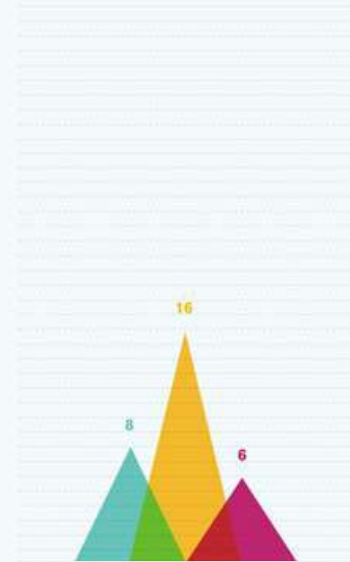
Percentage of children younger than 18 years old living in poor households, 2009.

Poverty

Black & Hispanic children are three times more likely to live in poverty than Whites.

Household Net Worth

The median net worth of White households with children is six times greater than Hispanic ones and 18 times greater than Black ones.



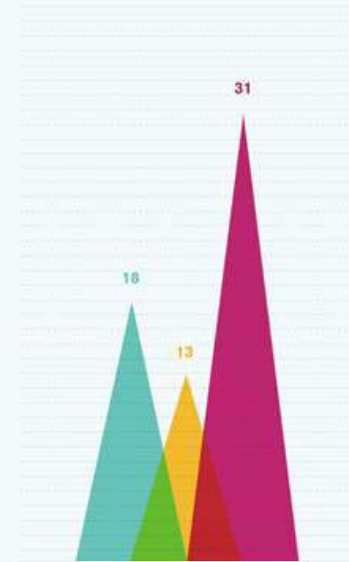
Percentage of children younger than 18 years old who don't have health insurance, 2009.

Health

Hispanic children are twice as likely as Blacks & Whites to have no health insurance.

Infant Mortality

Black infants are twice as likely to die before reaching a year of age as White and Hispanic infants.



Percentage of adults over 25 years old who have attained a four-year college degree, 2009.

Education

White children are twice as likely to graduate college as Blacks & Hispanics.

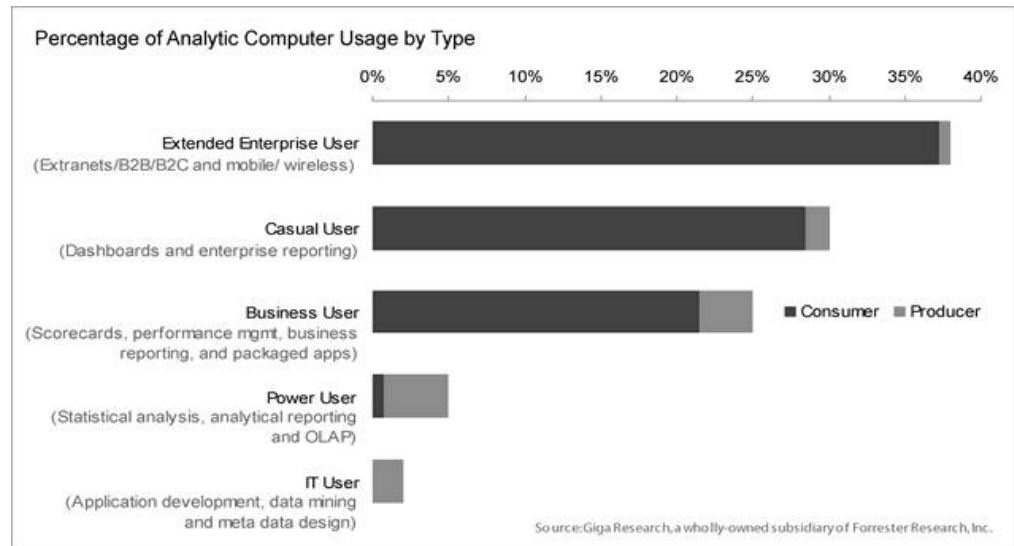
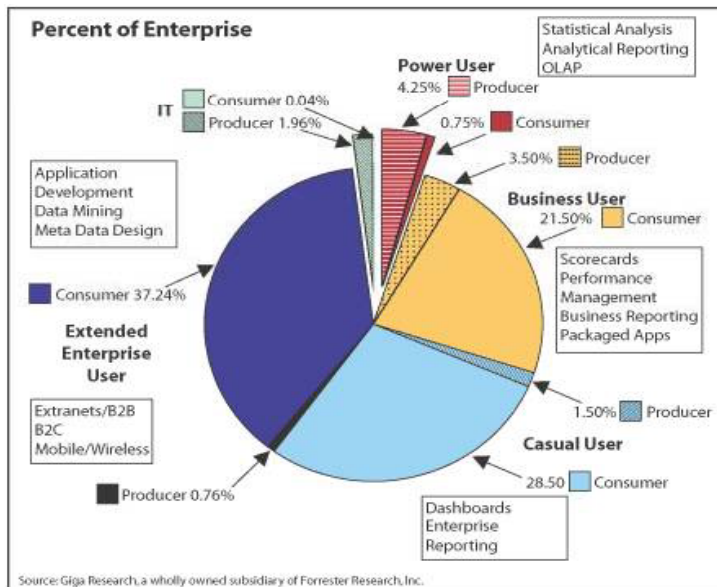
College Barriers

84% of Black students cannot read or do math at grade level.

74% of Hispanic youths need to help support their family.

83% of non-college going White students cite lack of scholarships as the reason.

Get to the point!
What is the story? What is the context?



Use the correct format!
 What visualization works best?

Contrast

Provides **emphasis** to a particular pattern or trend.

Repetition

Repeat **consistent** elements in familiar **places**.

Alignment

Design elements using the **invisible grid**.

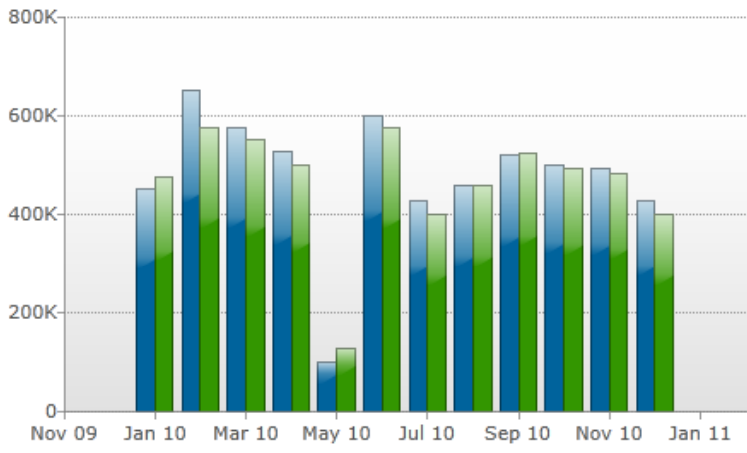
Proximity

Group elements together to create **one unit**.

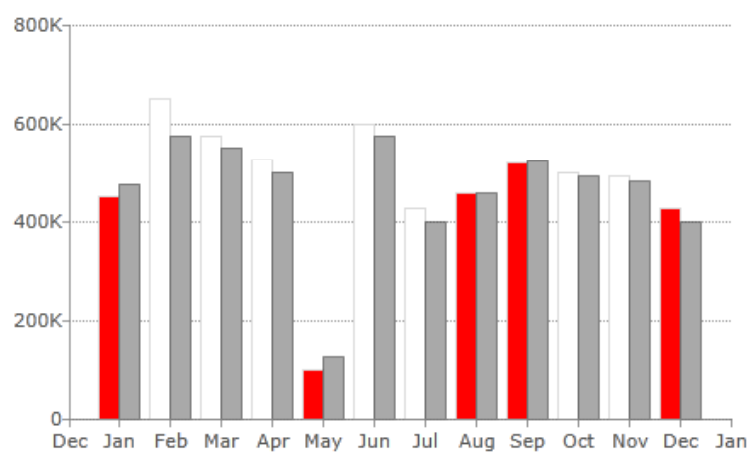
Highlight what's important!

Do the **relationships**, **patterns** and **trends** emerge?

Monthly Revenue vs. Goal (\$) ■ Revenue ■ Goal

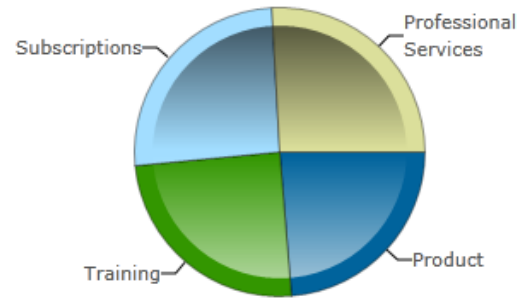


Monthly Revenue vs. Goal (\$)

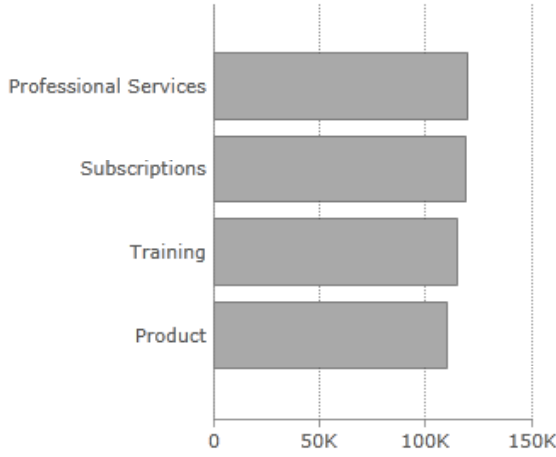


■ Under Goal ■ Revenue ■ Goal

Revenue By Product



Revenue By Product



Contrast

Provides **emphasis** to a particular pattern or trend.



Repetition

Repeat **consistent** elements in familiar **places**.

THE PERIODIC TABLE OF JAZZ

AN EVOLUTION OF JAZZ STYLE, IMPROVISATION AND INNOVATION VISUALIZED

L ¹ Louis Armstrong																Jr ² Jelly Roll Morton	
Hk ³ Coleman Hawkins	Pz ⁴ Lester Young											Ro ⁵ Roy Eldridge	Lu ⁶ Jimmie Lunceford	A ⁷ Art Tatum	B ⁸ Benny Goodman	C ⁹ Count Basie	D ¹⁰ Duke Ellington
Bi ¹¹ Charlie Parker	Dz ¹² Dizzy Gillespie											Dx ¹³ Dexter Gordon	Mx ¹⁴ Max Roach	Le ¹⁵ Lee Konitz	Tr ¹⁶ Lennie Tristano	Bd ¹⁷ Bud Powell	Th ¹⁸ Thelonious Monk
Nk ¹⁹ Sonny Rollins	Cl ²⁰ Clifford Brown	Go ²¹ Benny Golson	Ha ²² Hank Mobley	Gz ²³ Stan Getz	Ju ²⁴ Gerry Mulligan	Ca ²⁵ Cannonball Adderley	Ch ²⁶ Chet Baker	M ²⁷ Miles Davis	G ²⁸ Gil Evans	Lm ²⁹ Lee Morgan	Mq ³⁰ John Lewis	Bu ³¹ Art Blakey	Ly ³² George Russell	Ni ³³ Herbie Nichols	Ag ³⁴ Horace Silver	Da ³⁵ Dave Brubeck	
T ³⁶ John Coltrane	O ³⁷ Ornette Coleman	Ay ³⁸ Albert Ayler	Do ³⁹ Eric Dolphy	Sh ⁴⁰ Archie Shepp	Jm ⁴¹ Jackie McLean	Jh ⁴² Joe Henderson	W ⁴³ Wayne Shorter	Mi ⁴⁴ Miles Davis	F ⁴⁵ Freddie Hubbard	Mu ⁴⁶ Charles Mingus	Ah ⁴⁷ Andrew Hill	El ⁴⁸ Elvin Jones	Ce ⁴⁹ Cecil Taylor	Hb ⁵⁰ Herbie Hancock	Mc ⁵¹ McCoy Tyner	Be ⁵² Bill Evans	
Wr ⁵³ Weather Report	Ma ⁵⁴ Mahavishnu Orchestra	Ac ⁵⁵ Art Ensemble of Chicago	Br ⁵⁶ Anthony Braxton	Ja ⁵⁷ Jan Garbarek	Eb ⁵⁸ Eberhard Weber	Lb ⁵⁹ Dave Liebman	Gr ⁶⁰ Steve Grossman	MI ⁶¹ Miles Davis	Wo ⁶² Woody Shaw	Kw ⁶³ Kenny Wheeler	Jp ⁶⁴ Jaco Pastorius	Or ⁶⁵ Oregon	Pb ⁶⁶ Paul Bley	Ch ⁶⁷ Chick Corea	Z ⁶⁸ Joe Zawinul	K ⁶⁹ Keith Jarrett	
Sk ⁷⁰ Wynton Marsalis	St ⁷¹ Branford Marsalis	Lo ⁷² Joe Lovano	Co ⁷³ Steve Coleman	Zn ⁷⁴ John Zorn	Tb ⁷⁵ Tim Berne	Mb ⁷⁶ Michael Brecker	Kg ⁷⁷ Kenny Garrett	Te ⁷⁸ Terence Blanchard	Rb ⁷⁹ Randy Brecker	Tm ⁸⁰ Tom Harrell	Sc ⁸¹ John Scofield	Pm ⁸² Pat Metheny	Cb ⁸³ Carla Bley	Ad ⁸⁴ Anthony Davis	Ga ⁸⁵ Geri Allen	Dt ⁸⁶ Kenny Kirkland	

TENOR SAXOPHONE
TRUMPET
PIANO
MILES DAVIS

ALTO/BARI SAXOPHONE
DRUMS/BASS/GUITAR
BAND/BANDLEADER OR COMPOSER/ARRANGER



Js ⁸⁷ Joshua Redman	Go ⁸⁸ Greg Osby	Dm ⁸⁹ David Murray	Dw ⁹⁰ David S. Ware	Jb ⁹¹ Jerry Bergonzi	Np ⁹² Nicholas Payton	Dd ⁹³ Dave Douglas	Rh ⁹⁴ Roy Hargrove	Dh ⁹⁵ Dave Holland	Bf ⁹⁶ Bill Frisell	Wh ⁹⁷ Wayne Horvitz	Jc ⁹⁸ Joey Calderazzo	Mh ⁹⁹ Brad Mehldau
Xe ¹⁰⁰ Miguel Zenon	Sb ¹⁰¹ Seamus Blake	Ck ¹⁰² Chris Cheek	Mt ¹⁰³ Mark Turner	Cp ¹⁰⁴ Chris Potter	Mw ¹⁰⁵ Medeski, Martin, Wood	Es ¹⁰⁶ Esbjorn Svensson Trio	Ms ¹⁰⁷ Maria Schneider	Vj ¹⁰⁸ Vijay Iyer	Bp ¹⁰⁹ The Bad Plus	Mn ¹¹⁰ Jason Moran	Cr ¹¹¹ Craig Taborn	Kz ¹¹² Geoff Keezer

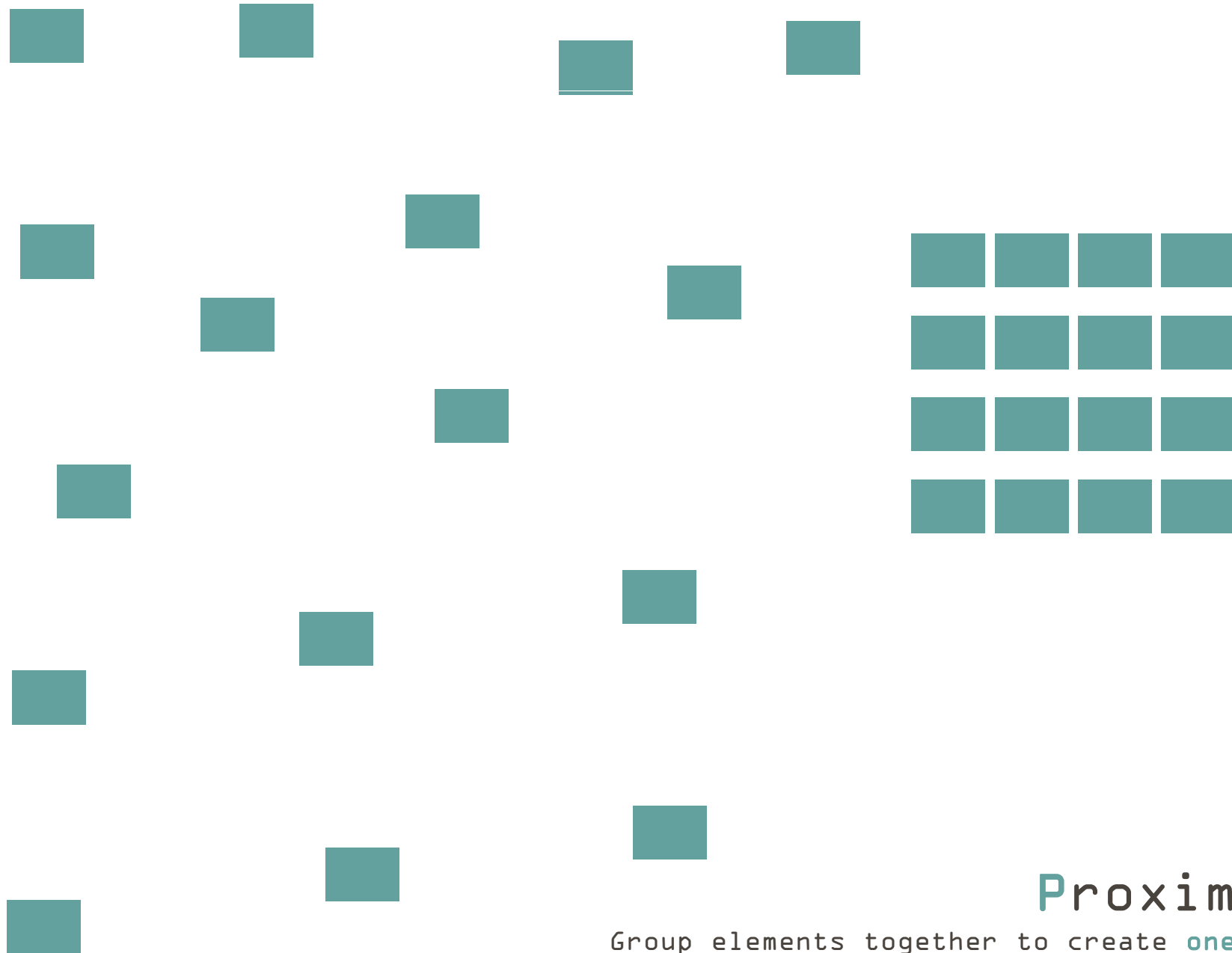
EACH TABLE ROW ROUGHLY CORRESPONDS TO A DECADE, BEGINNING WITH THE 1920S.

FOR MORE DETAILS ABOUT THIS POSTER AND ITS CREATION, PLEASE VISIT [HTTP://REDRASPUS.COM](http://redraspus.com)

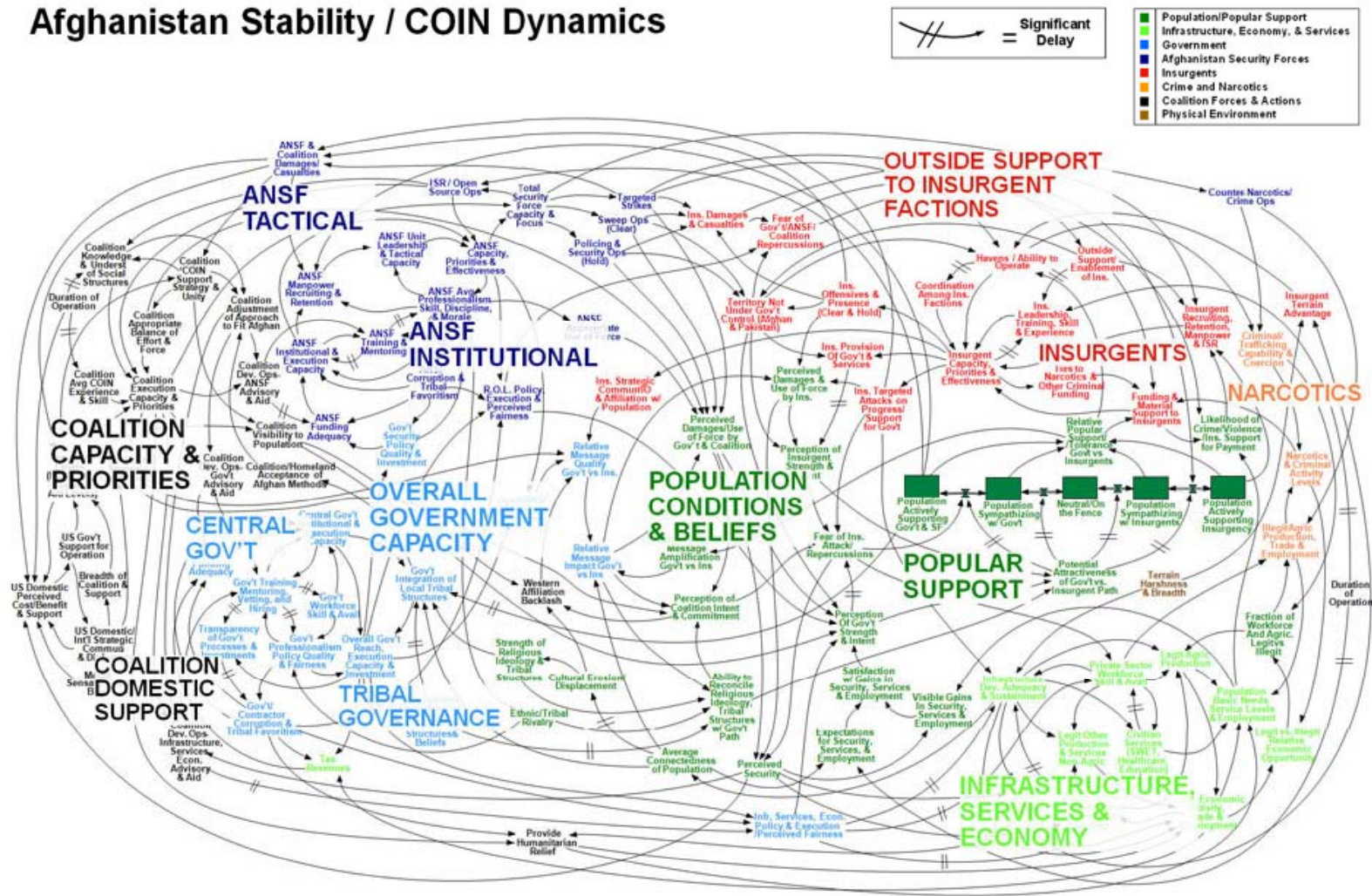
© 2010 DAVID MARRIOTT, JR.

Alignment

Design elements using the invisible grid.



Afghanistan Stability / COIN Dynamics



WORKING DRAFT - V3

Keep it simple!
Strip unnecessary data to eliminate clutter.

LINE



A line is a mark between two points. There are various types of lines, from straight to squiggly to curved and more. Lines can be used for a wide range of purposes: stressing a word or phrase, connecting content to one another, creating patterns and much more.

SHAPE



Height + width = shape. We all learned basic shapes in grade school - triangles, squares, circles and rectangles. Odd or lesser seen shapes can be used to attract attention.

There are three basic types of shape: geometric (triangles, squares, circles etc), natural (leaves, animals, trees, people), and abstracted (icons, stylizations, graphic representations etc).

VALUE



Value is how light or how dark an area looks. A gradient, shown above, is a great way to visualize value - everything from dark to white, all the shades in-between, has a value. Use value to create depth and light; to create a pattern; to lead the eye; or to emphasize.

COLOR

Color is used to generate emotions, define importance, create visual interest and more. CMYK (cyan/magenta/yellow/black) is subtractive; RGB (red/green/blue) is additive.

Some colors are warm and active (orange, red); some are cool and passive (blue, purple).

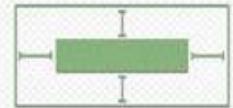
There are various color types (primary to analogous) and relationships (monochromatic to triad) worth learning more about as well.

TEXTURE



Texture relates to the surface of an object; the look or feel of it. Concrete has a rough texture; drywall has a smooth and subtle texture. Using texture in design is a great way to add depth and visual interest. Printed material has actual, textile texture while screen material has implied texture.

ELEMENTS OF DESIGN
quick reference sheet



Space is the area around or between elements in a design. It can be used to separate or group information. Use it effectively to: give the eye a rest; define importance; lead the eye through a design and more.

SIZE



Size is how small or large something is: a small shirt vs. an extra large shirt, for example. Use size to define importance, create visual interest in a design (via contrasting sizes), attract attention and more.

SPACE

paper leaf
created by Paper Leaf Design, www.paper-leaf.com

BASIC DESIGN ELEMENTS



X CLOSE

Suggest Now »



?l=en&safe=active&sa=X&biw=1402&bih=802&rbm=isch&prmd=imvns&tomid=wxoYXSFt0PcaM:&imgrefid=http://www.ioffer.com/i/kate-bush-poster-vintage-secret-history-of-by-vermorel-198763192&coocid=bd-V

Shapes and Forms

The center square of any good visual. Shapes are 2D. Forms are 3D.

COLOR THEORY

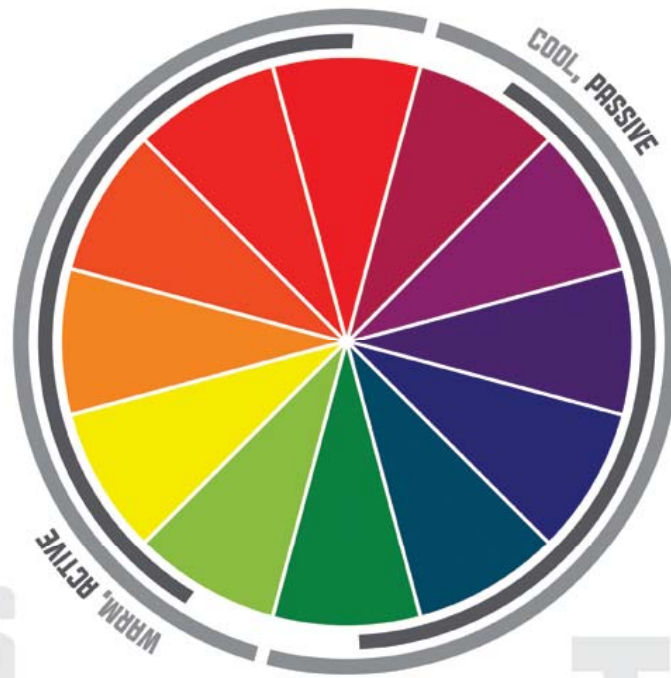
QUICK REFERENCE SHEET FOR DESIGNERS

SUBTRACTIVE

CREATED WITH INK;
START WITH WHITE, ADD COLOR.
CMYK



COLOR TYPES



ADDITIVE

CREATED WITH LIGHT;
START WITH BLACK, ADD COLOR.
RGB



COLOR RELATIONSHIPS



MEANINGS



TERMS

CHROMA: How pure a hue is in relation to gray
SATURATION: The degree of purity of a hue
INTENSITY: The brightness or dullness of a hue
LUMINANCE/VALUE: A measure of the amount of light reflected from a hue
SHADE: A hue produced by the addition of black
TINT: A hue produced by the addition of white

*Designed by Paper Leaf Designs, with thanks & credit to worqx.com & color-wheel-pro.com

Color and Value

Hue, value and intensity. Can enhance meaning in a powerful way.

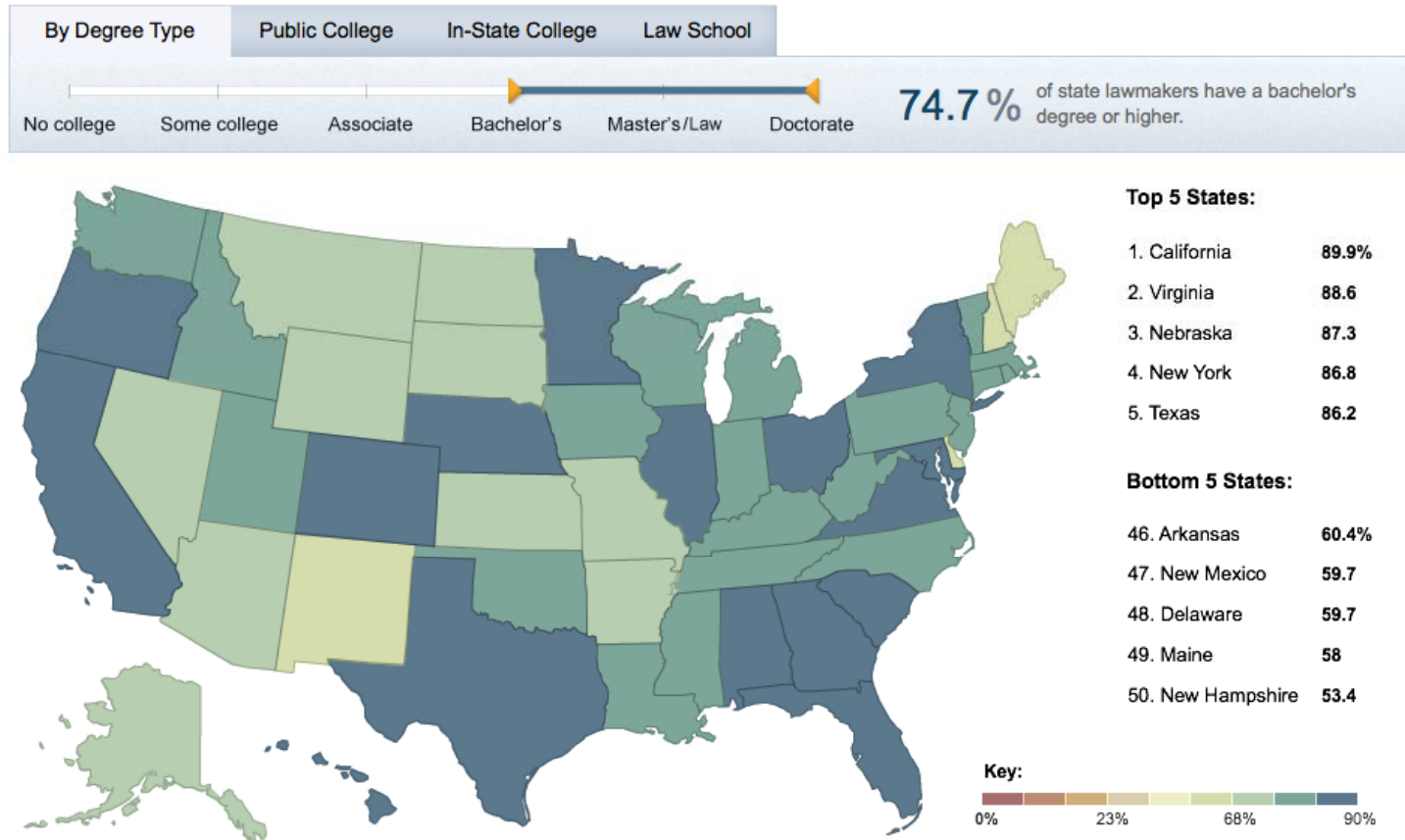


Space

White space is the part of the design that isn't "there".

How educated are state legislators?

The Chronicle has looked at where each of the 7,000-plus state legislators in America went to college—or whether they went at all. In doing so, we got a glimpse of how the citizens who hold these seats reflect the average American experience.



Built by Josh Keller and Alex Richards / Produced by Xarissa Holdaway, Gabriela Montell, and Carmen Mendoza

DESIGN IN PRACTICE

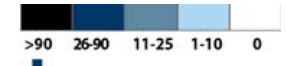
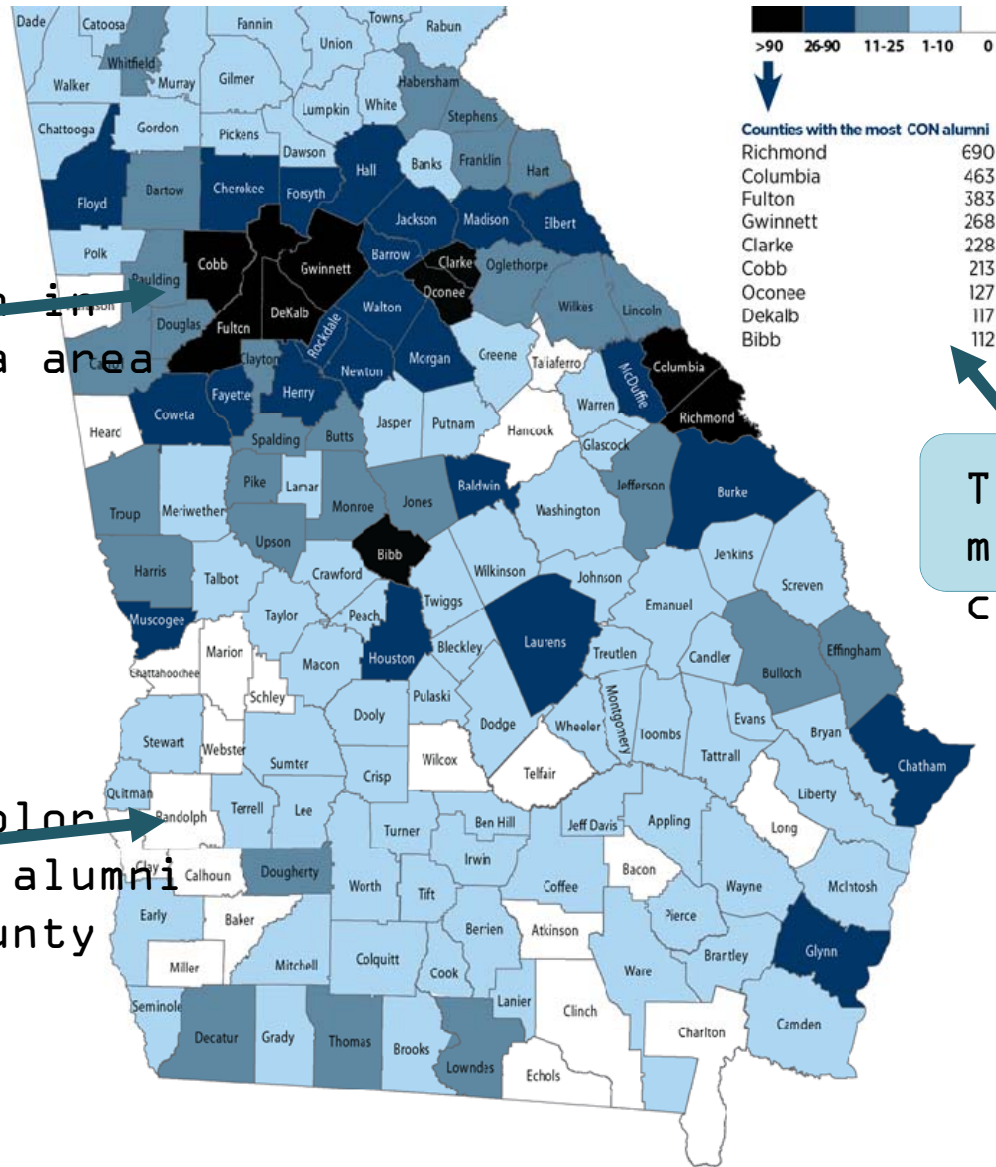
How many Nursing alumni live in Georgia?

Fiscal Year 2012	Count
Nursing Alumni in Georgia	4,366
Total Nursing Alumni	6,356

How many Nursing alumni live in Georgia?

County	#	County	#	County	#
Appling	4	Calhoun	0	Cook	2
Atkinson	0	Camden	5	Coweta	31
Bacon	0	Candler	4	Crawford	1
Baldwin	40	Carroll	20	Crisp	10
Banks	2	Catoosa	10	Dade	2
Barrow	47	Charlton	0	Dawson	3
Bartow	11	Chatham	84	Decatur	11
Ben Hill	4	Chattahoochee	0	Dekalb	117
Berrien	3	Chattooga	7	Dodge	8
Bibb	112	Cherokee	65	Dooly	2
Bleckley	5	Clarke	228	Dougherty	21
Brantley	1	Clayton	17	Douglas	16
Brooks	2	Clinch	0	Early	2
Bryan	10	Cobb	213	Effingham	11
Bulloch	17	Coffee	7	Elbert	27
Burke	26	Colquitt	5	Emanuel	7
Butts	12	Columbia	463	Evans	7

Nursing Alumni in Georgia



Counties with the most CON alumni

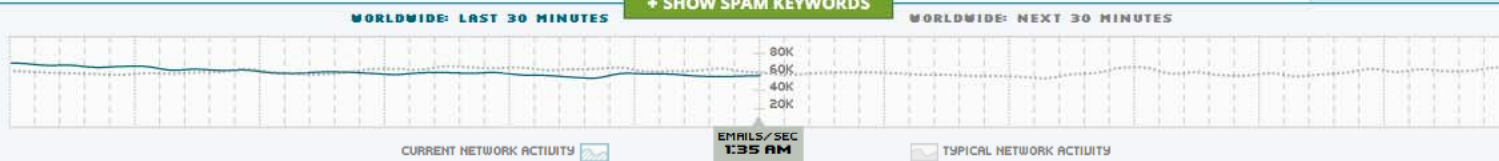
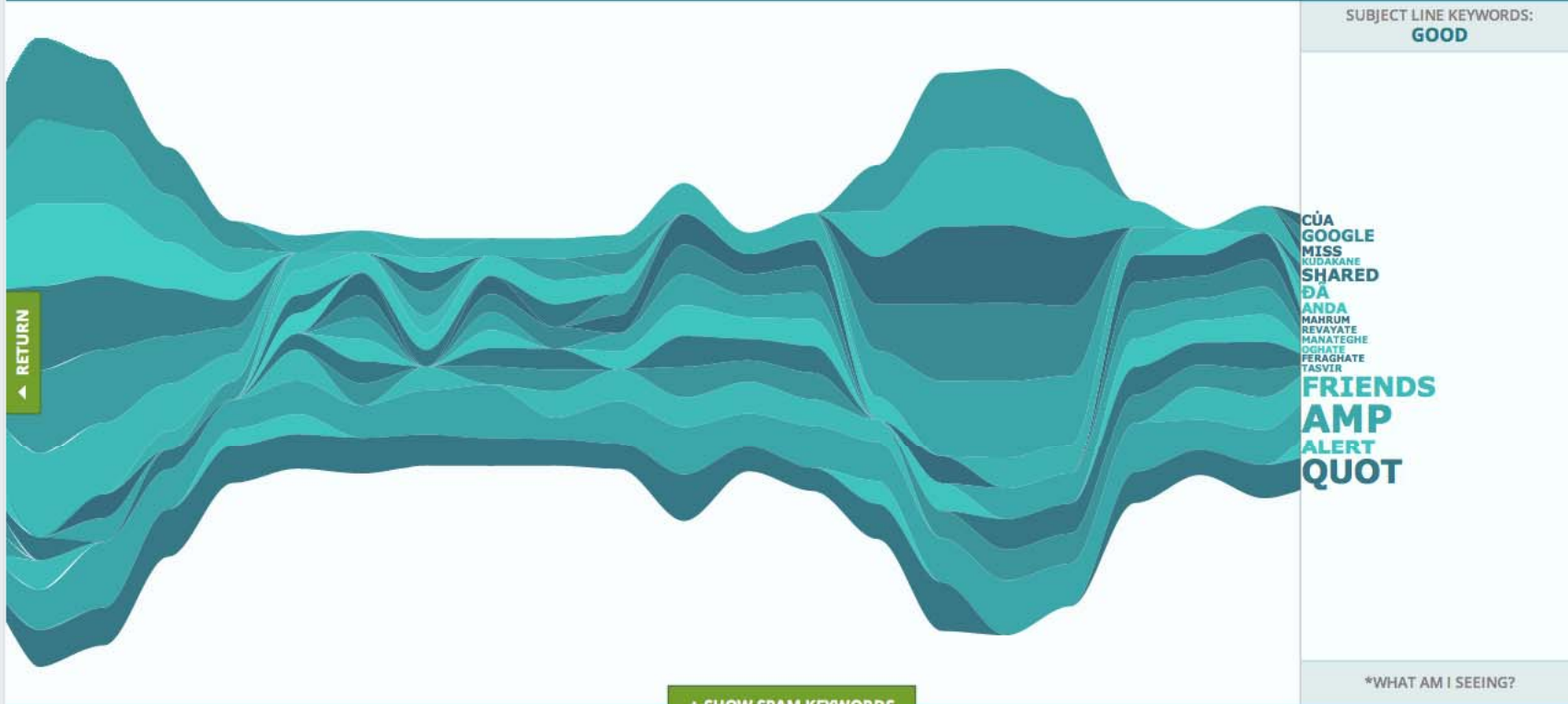
Richmond	690
Columbia	463
Fulton	383
Gwinnett	268
Clarke	228
Cobb	213
Oconee	127
Dekalb	117
Bibb	112

Concentration in Metro Atlanta area

Top 10 list give more detail for comparison

Absence of color indicates no alumni live in a county

THE Yahoo! MAIL NETWORK IS DELIVERING **58,820** EMAILS PER SECOND WORLDWIDE.



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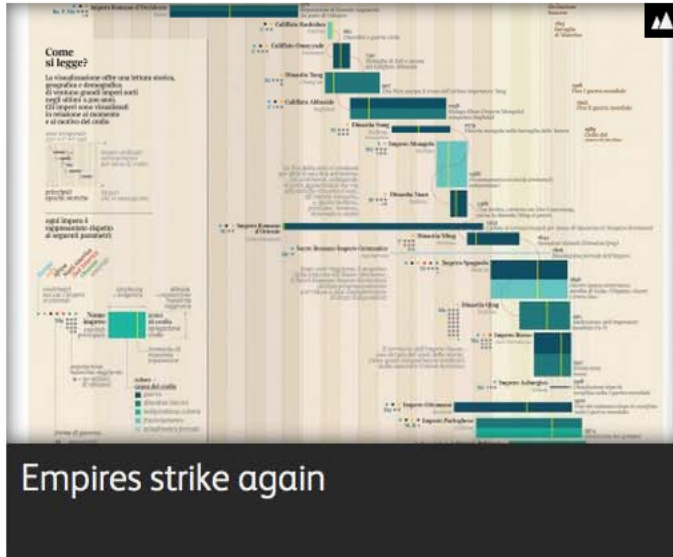
FUTURE OF DATA



Hans Rosling @ Gapminder

<http://www.gapminder.com>

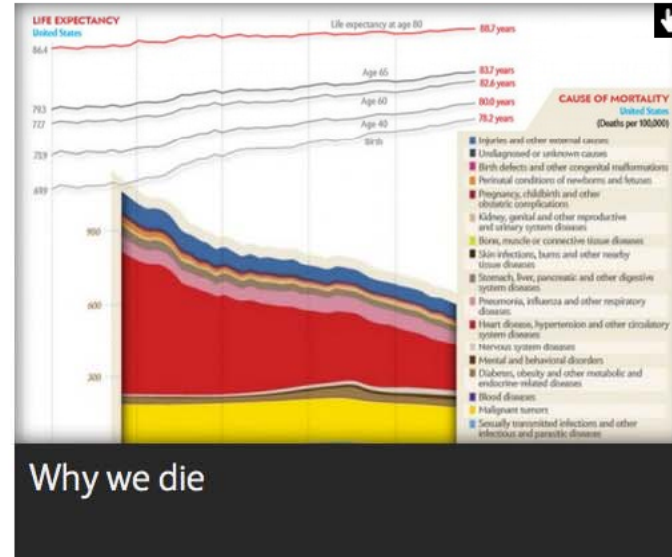
Hey designers — join the marketplace to be connected to high paying and meaningful work



Empires strike again

added by [accurat](#)

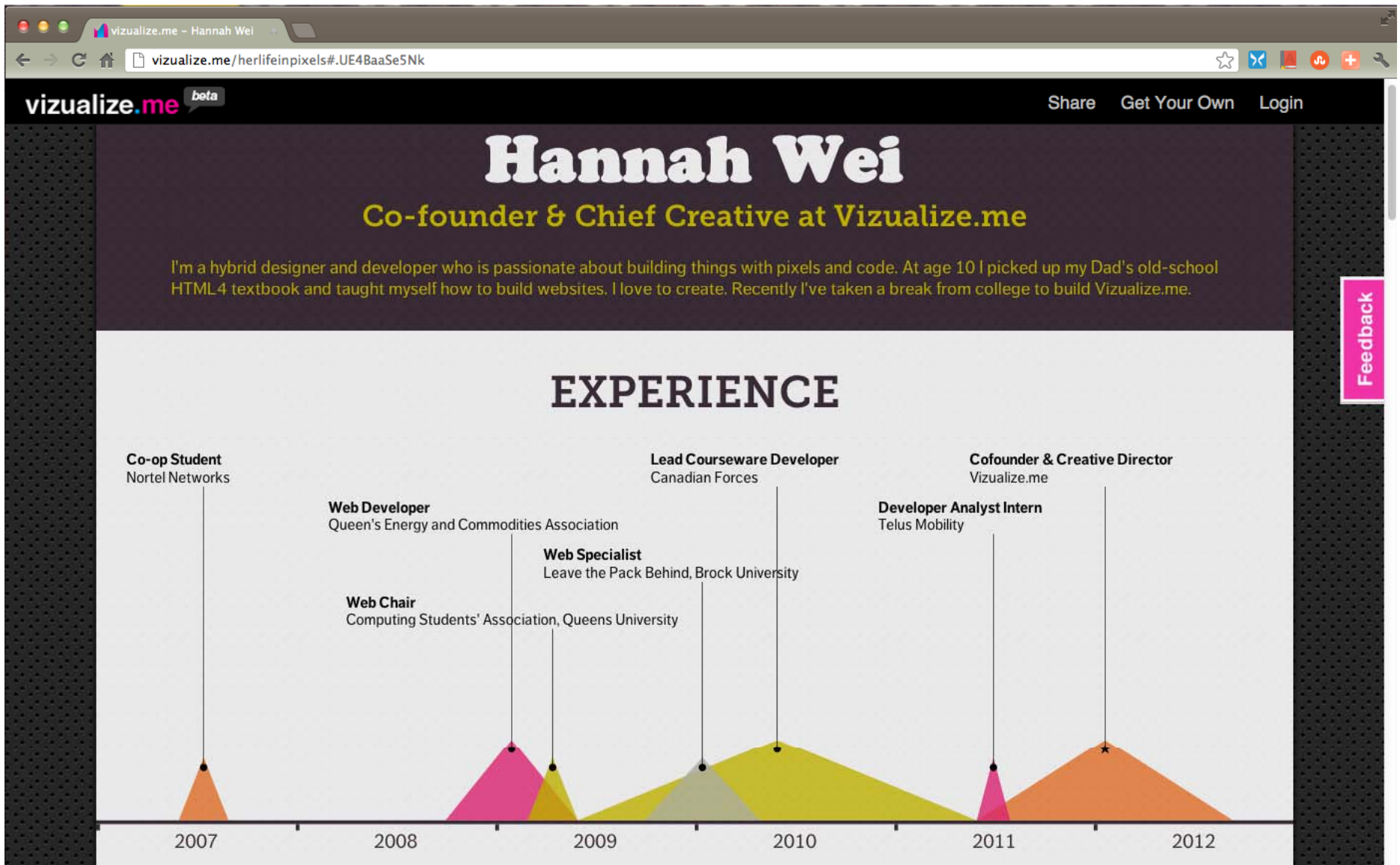
Do we really know the reason why the biggest empires collapsed? The visualization proposes a new historical, geographical and demographical render ... [Learn More](#)



Why we die

added by [adam](#)

A baby born in the U.S. this year is likely to live to blow out 78 birthday candles—a far longer average life span than someone born even in the ... [Learn More](#)



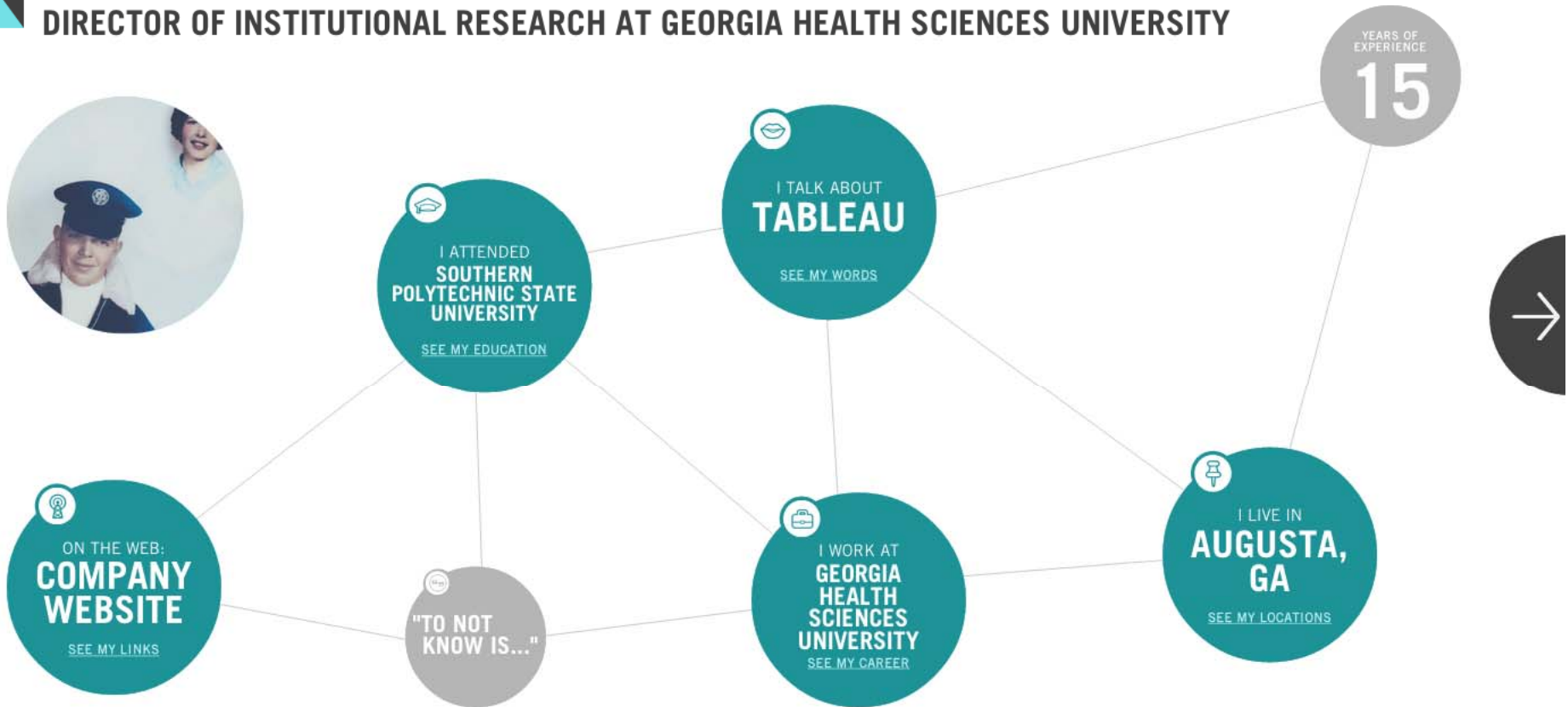
Visualize.Me
<http://www.visualize.me>

HOLLY GOODSON

ACCOUNT | SIGN OUT *Vizify*

INVITE | SHARE | EDIT | NEW PAGE

DIRECTOR OF INSTITUTIONAL RESEARCH AT GEORGIA HEALTH SCIENCES UNIVERSITY



Thank you!

Presentation link: <http://portal.sliderocket.com/BAAUN/Art-Science-of-Designing-Data>

Work link: <http://www.georgiahealth.edu/ie>

Folio link: <http://www.goodgirlgraphics.com>

LinkedIn: <http://www.linkedin.com/in/hollyvann>

Vizify: <https://www.vizify.com/holly-goodson>

DISCUSSION QUESTION

What key principles for data visualization are most important for providing decision support?

15
minutes

ENVISIONING AND DEVELOPING A DECISION SUPPORT FUNCTION

Chet Warzynski

Executive Director

Office of Organizational Development

Georgia Institute of Technology

Kevin Center

Senior Director

Office of Organizational Development

Georgia Institute of Technology¹

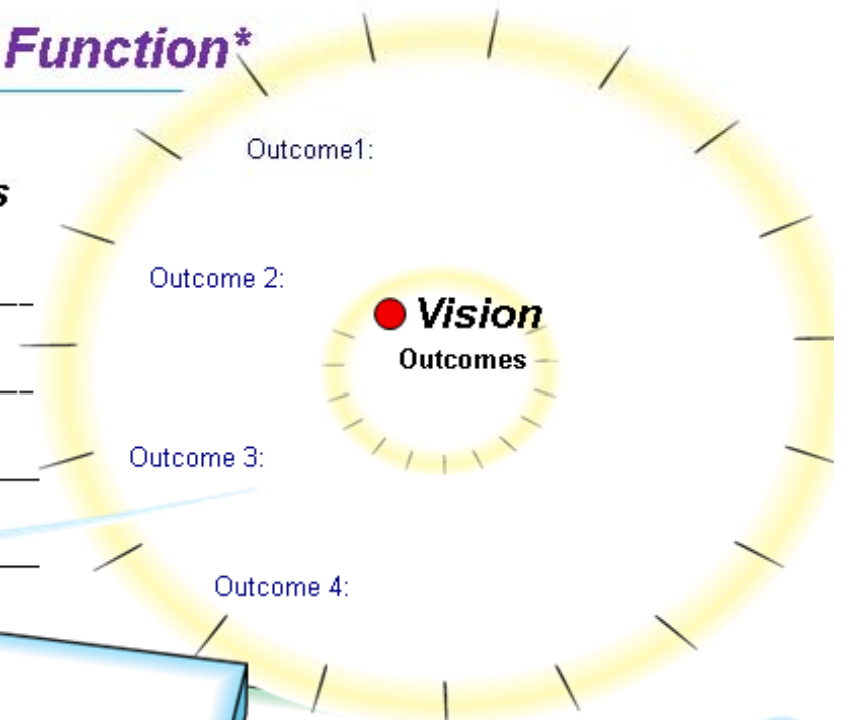
Exercise: Designing a Decision Support Function*

● Mission

Central Purpose of Decision Support:

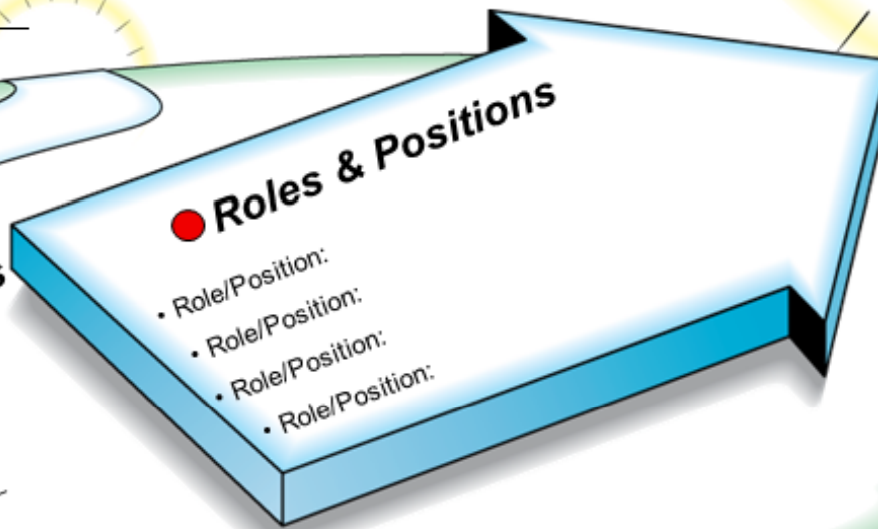
● Values/Operating Principles

- Value/Principle: _____
- Value/Principle: _____
- Value/Principle: _____
- Value Principle: _____



● Core Competencies

1. _____
2. _____
3. _____
4. _____
5. _____



● Prerequisites for Success

1. _____
2. _____
3. _____

● Metrics

1. _____
2. _____
3. _____
4. _____
5. _____

● Decision Support Studies

1. _____
2. _____
3. _____

*Adapted from *The Journey*, San Francisco: The Grove Consultants International.

GROUP ACTIVITY

Complete the organizational template representing your group's decision support function

GROUP FEEDBACK

THANK YOU!

FOR MORE INFORMATION, PLEASE CONTACT

SANDI BRAMBLETT

EXECUTIVE DIRECTOR

INSTITUTE RESEARCH AND PLANNING

GEORGIA INSTITUTE OF TECHNOLOGY

SANDI@GATECH.EDU

