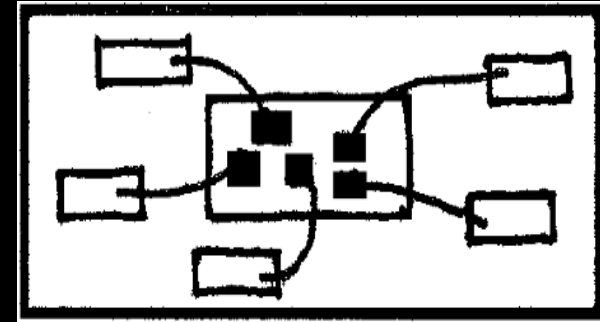
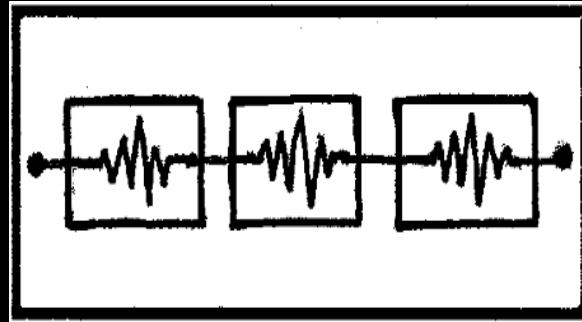
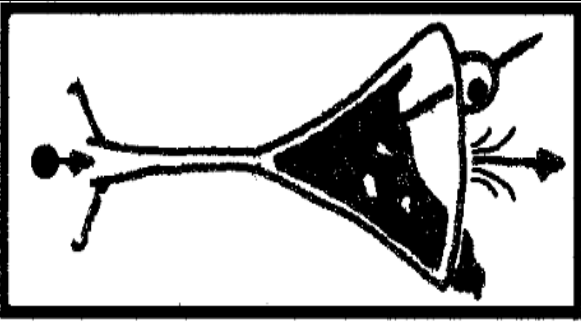


**CSE 442** - Data Visualization

# Narrative Visualization

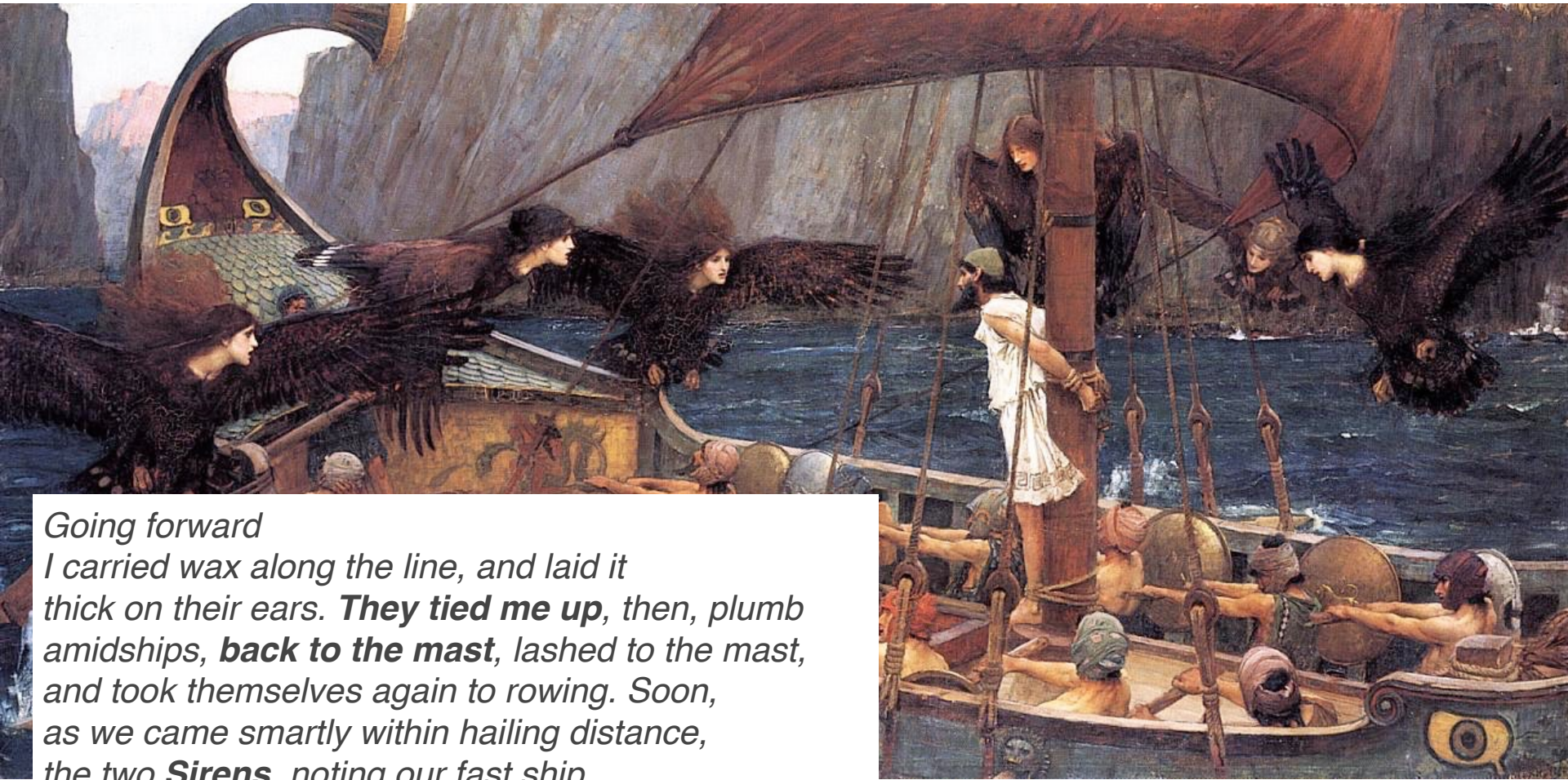


**Matthew Conlen** University of Washington

(with material from Jeff Heer, Edward Segel, and Jessica Hullman)

# STORYTELLING

as ancient as mankind



*Going forward*

*I carried wax along the line, and laid it thick on their ears. **They tied me up**, then, plumb amidships, **back to the mast**, lashed to the mast, and took themselves again to rowing. Soon, as we came smartly within hailing distance, the two **Sirens**, noting our fast ship, off their point, **made ready, and they sang...***

# STORYTELLING

across various media

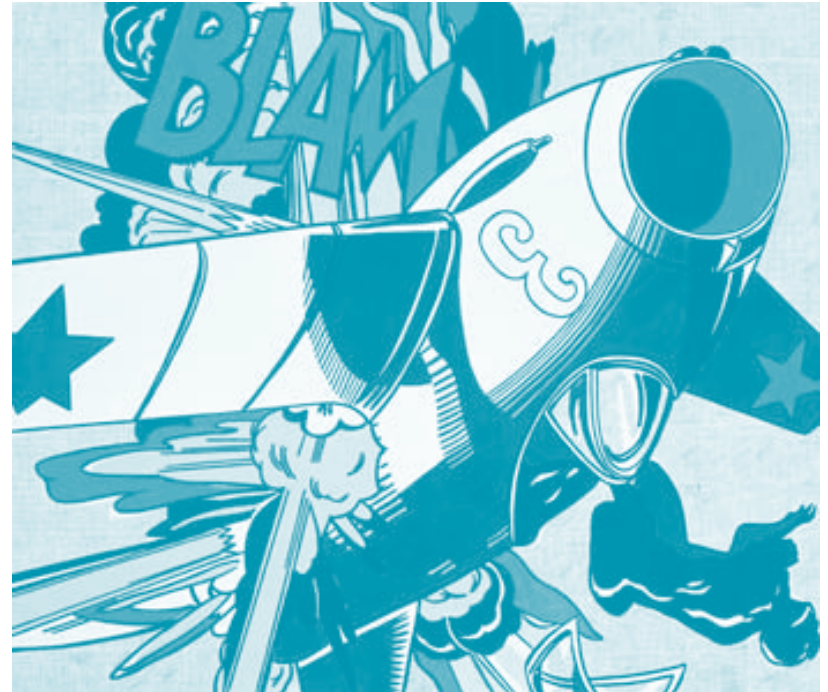
PEOPLE TELL STORIES

WORDS TELL STORIES

IMAGES TELL STORIES

COMICS TELL STORIES

MOVIES TELL STORIES



# Narrative Story-Telling

**narrative** (n): An account of a series of events, facts, etc., given in order and with the establishing of connections between them.

Effective story-telling “require[s] skills like those familiar to movie directors, beyond a technical expert’s knowledge of computer engineering and science.” - Gershon & Page '01

August 26, 2010

# Generals Wary of Move to Cut Their Ranks

By [GINGER THOMPSON](#) and [THOM SHANKER](#)

WASHINGTON — Maj. Gen. Paul D. Eaton, a retired Army officer, is familiar with the perks and pitfalls of power, having commanded tens of thousands of troops at Fort Benning, Ga., managed budgets exceeding \$2 billion in Iraq, and overseen layers upon layers of staff members who helped manage both his professional duties and his personal life.

He has experienced the full range of lifestyles that come with military leadership, living at one point in an elegant antebellum mansion, and at another, with eight other officers crowded in a marble bathhouse behind one of [Saddam Hussein's](#) old palaces.

When he traveled, he was occasionally able to justify the use of military aircraft, but most times, he said, he flew coach. And today he lives on a pension worth 75 percent of his military salary, with health benefits that cover everything except dental and eye care for himself and his wife.

“We are well compensated, and we live very comfortable lives,” General Eaton said, referring to the military’s most senior leaders. “But when you look at all the things going on around a general, the nation is getting a very, very high return on its money.”

Not everyone at the Pentagon agrees. Two weeks ago, Defense Secretary [Robert M. Gates](#) announced a sweeping effort to improve efficiency that, among other things, takes aim at the military’s sacrosanct corps of generals and admirals, ordering his staff to cut at least 50 positions, and making clear that he would be happier if they cut more.

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**Anecdotal Lead**

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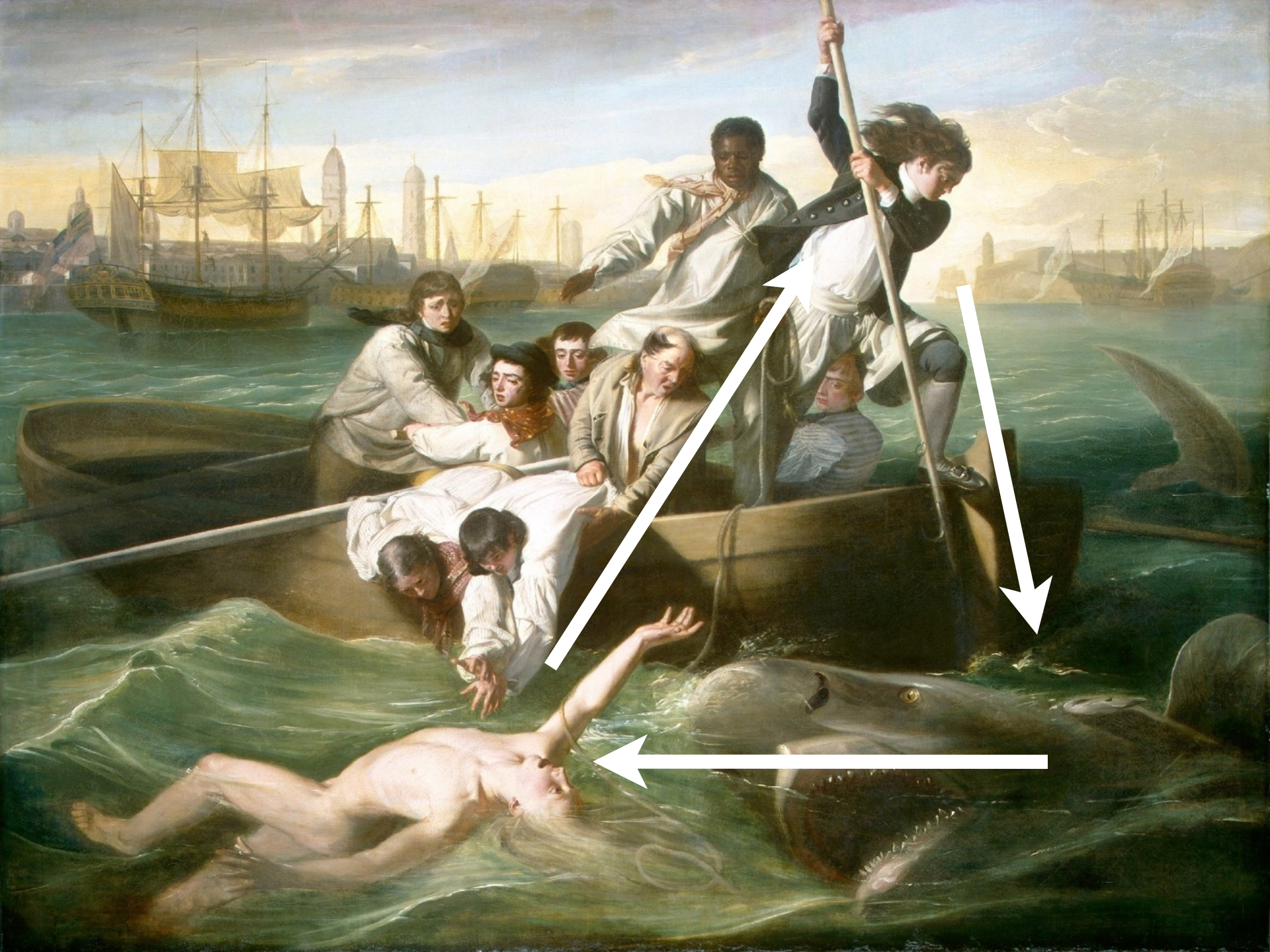
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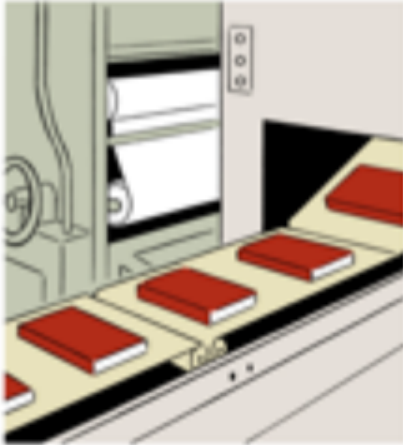
## Nut Graph

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# Topics

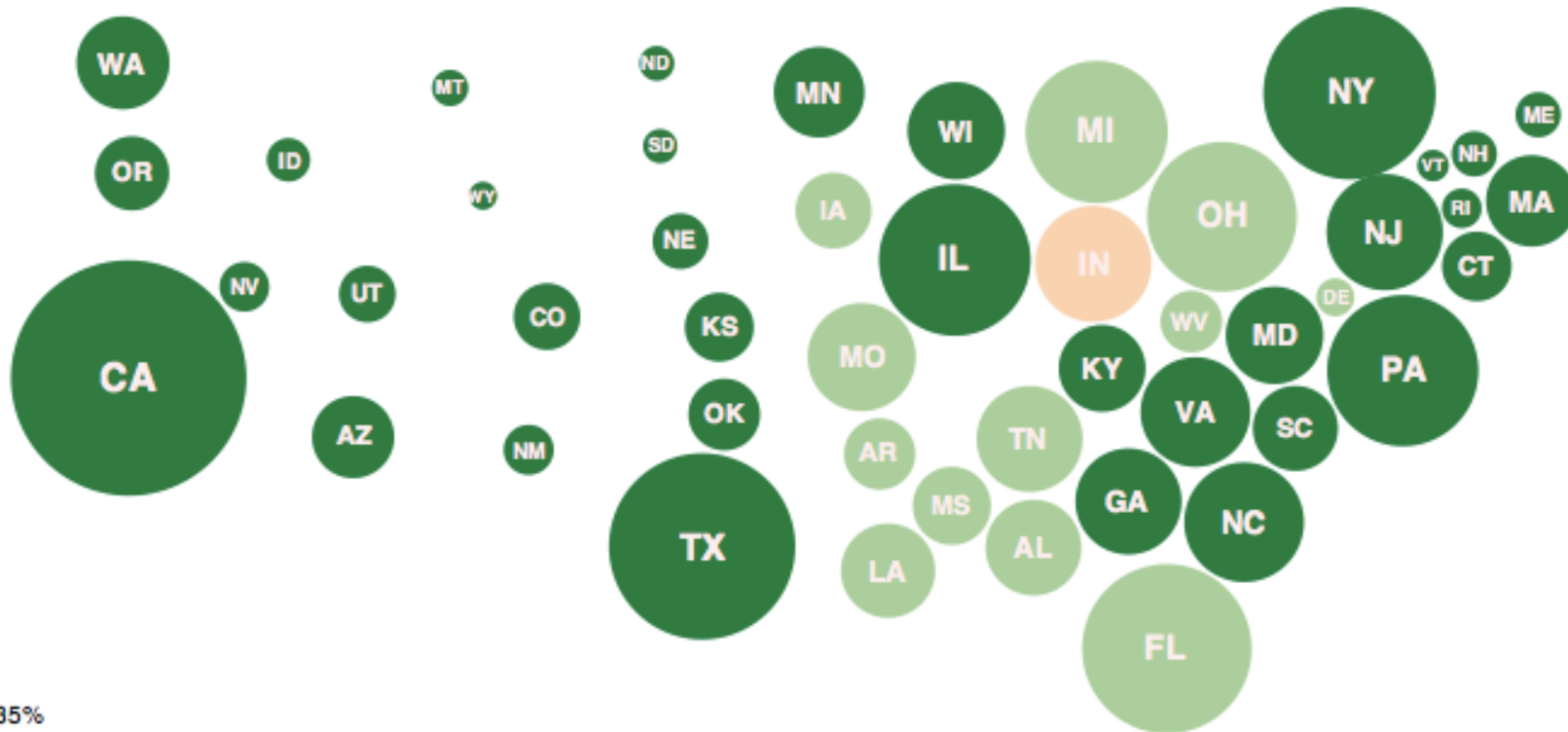
Narrative visualization design

Navigation in interactive documents

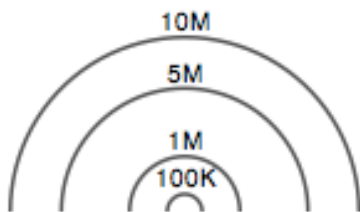
Chart sequence models

Automatic augmentation for communication

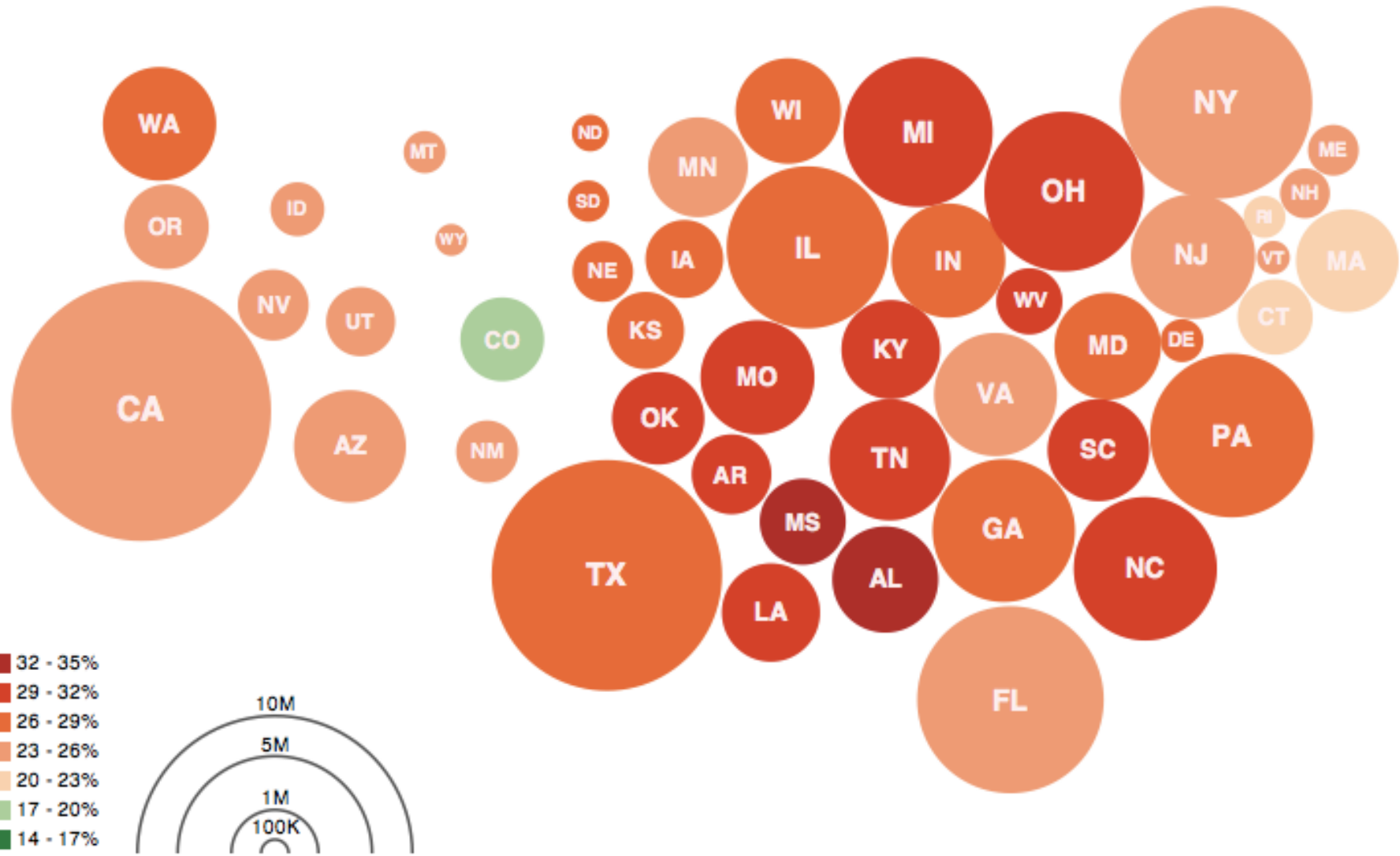
**Storytelling  
... with data?**



- 32 - 35%
- 29 - 32%
- 26 - 29%
- 23 - 26%
- 20 - 23%
- 17 - 20%
- 14 - 17%



Obesity Map Vadim Ogievetsky



Obesity Map Vadim Ogievetsky



### Privacy and the internet

## Lives of others

BY JAMES HAMILTON

Facebook and Google face a backlash, from users and regulators alike, over the way they have handled sensitive data

**J**OHNNIE STOCOMIE, Canada's privacy commissioner, interviews with Facebook in August over the social networking site's track record, agreeing to change its policies within a year to comply with the country's privacy law, says Alex Stedman, the company's attorney. It is being set as an important part of the deal, which included giving users a clear and easy-to-understand choice over whether to transmit data with third parties. "It doesn't seem to me that Facebook is going to be right to opt out of this issue," he says, noting that, without a change of course, the firm could soon become the subject of another formal investigation by his organisation.

Facebook is not the only internet giant to provoke the ire of data watchdogs. Google endured scathing criticism this week following news that it had accessed some personal communication sent over unsecured Wi-Fi data networks in homes and offices in some 30 countries. On May 11th Peter Schaar, Germany's federal commissioner for data protection, called for an independent investigation into Google's behaviour, claiming that it had "deeply disrupted normal rules in the development and usage of software."

The cases highlight rising tension between guardians of privacy and internet firms. And they reflect concern among web users about how private data are made public. Several prominent internet

ty moguls such as Cory Doctorow, a science-fiction author, and Iain Stewart, a politician, have abandoned Facebook. Since such as Gail Facebook Dwyer, a savings officer in Iowa, are leaving May 20 for a more Facebook-friendly state.

There is a risk of toppling the momentum of Facebook, which is poised to claim half a billion members and which drove over 100 million visitors as a whole to its headquarters in Menlo Park, where losses are swelling over how to respond. Several online folk are now linking that Facebook will soon roll out stricter privacy controls to make it easier to keep more data hidden. MySpace, a rival, is already making its controls stricter in an effort to woo disaffected Facebookers to its service.

A revolt over Facebook's handling of privacy has been brewing for some time. In December the social network changed the default settings on its privacy controls so that individuals' personal information would be shared with "everyone" rather than selected friends. Facebook argued this reflected a shift in society towards greater openness and noted that users could still adjust privacy settings back again. But internet privacy activists lobbied hard to be heard.

The switch should not have come as a surprise, truly or, many social networks

### Also in this section

- 68 Spring companies
- 80 The recovery of General Motors
- 86 Business crime in China
- 70 Italian retail
- 70 Japan's drug firms are the model
- 74 Brazil's tabacaria
- 74 Schumpeter: Duernmattel

See July 2011's special section on business, and [www.economist.com/business-theme](http://www.economist.com/business-theme)

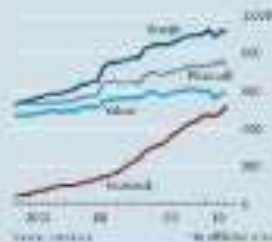
reportedly tough privacy policies in order to attract and increase users. But as more joint controls are gradually loosened to encourage more sharing, as people share more, Facebook can increase the traffic against which it sells advertising. And the more it learns about users' likes and dislikes, the better it can target ads that generate hundreds of millions of dollars.

Privacy groups have been following a developer's conference last month at which Mark Zuckerberg, Facebook's boss, announced yet another series of policy changes. One that raised irritation was an "opt-out personalisation" feature that lets users third-party websites access Facebook data when people visit. Critics say that Facebook has made it tricky to disable this feature, which may explain why its similar rival, LinkedIn, is so much.

European officials are questioning both Facebook's use. This month a group of data-protection experts also asked the European Commission more to be done on the web, calling for it to set a minimum default settings "non-adjustable". And as the

### Net living large

By David Foray



## Gun Deaths In America

By Ben Casselman, Matthew Conlen and  
Reuben Fischer-Baum

CLICK to advance

1

2

3

4

5

6

7

8

9

10

11

12

Explore the data for yourself »

This interactive graphic is part of our project exploring the more than 33,000 annual gun deaths in America and [what it would take](#) to bring that number down. See our stories on [suicides among middle-age men](#), [homicides of young black men](#) and [accidental deaths](#), or [explore the menu for more coverage](#).



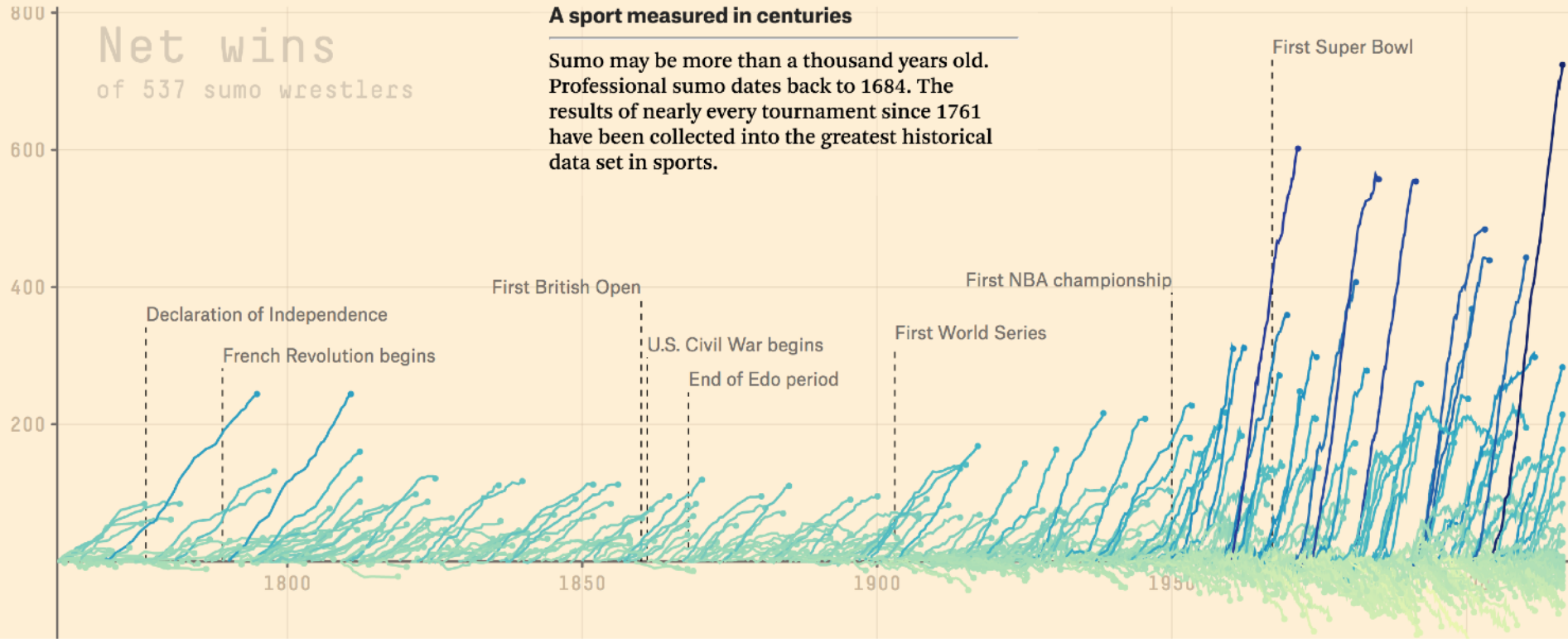
# A History Of Sumo

By Matthew Conlen

Net wins  
of 537 sumo wrestlers

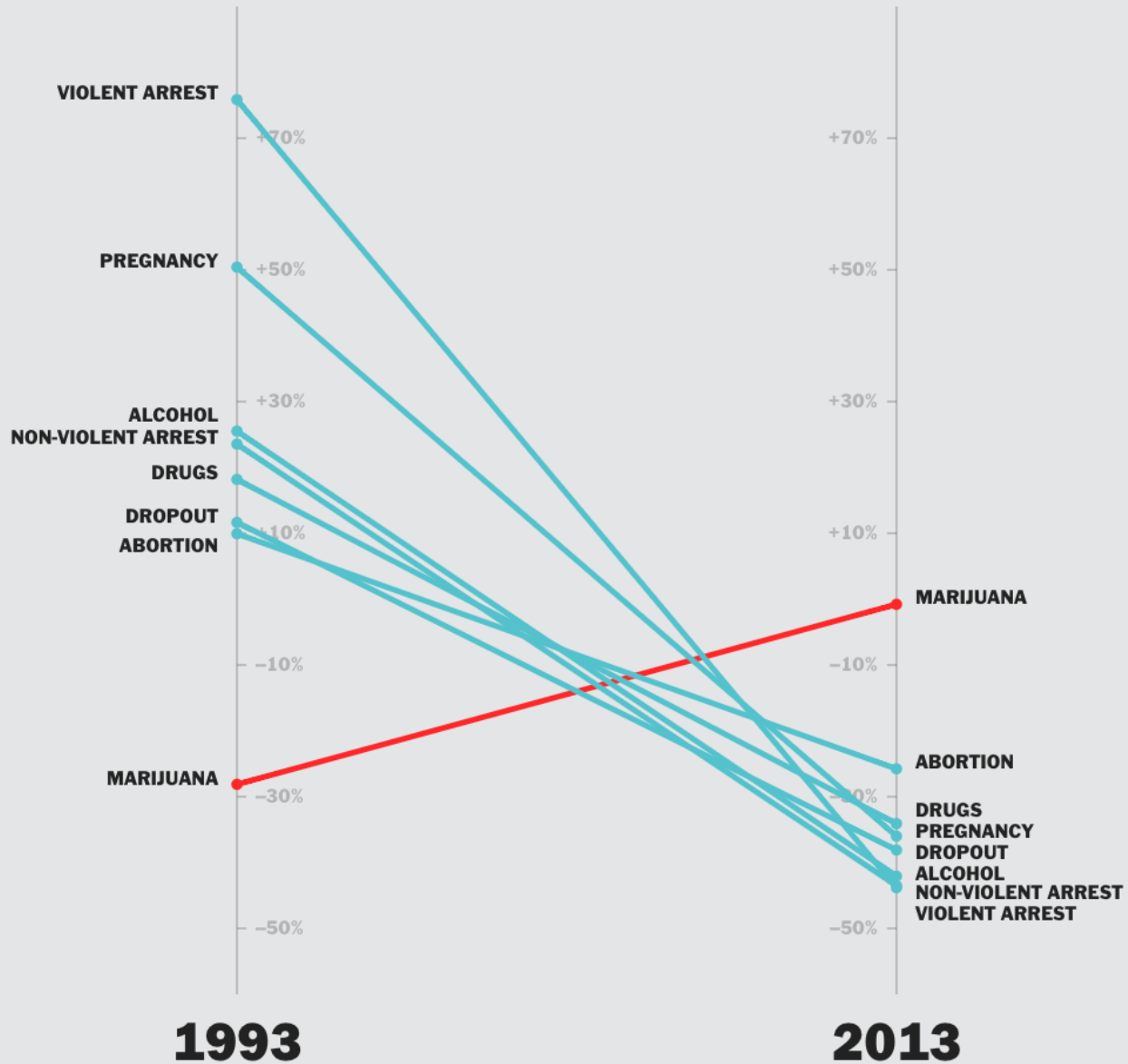
## A sport measured in centuries

Sumo may be more than a thousand years old. Professional sumo dates back to 1684. The results of nearly every tournament since 1761 have been collected into the greatest historical data set in sports.



# SHENANIGANS

Change in teen shenanigans from 1993 to 2013.  
Showing % difference from 2003 levels.



# Candidate campaign stops

Sept. 1



Trump

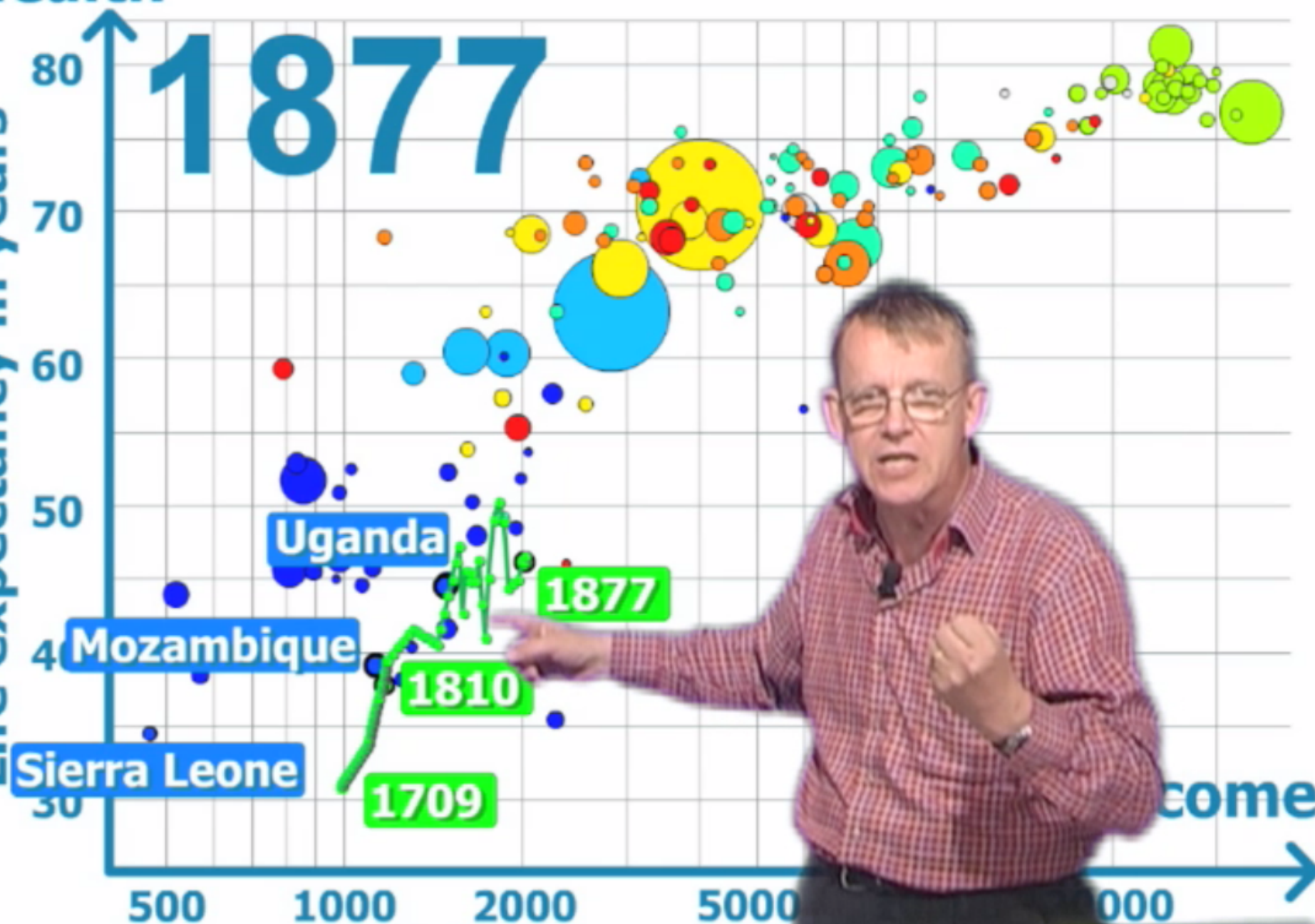


Clinton

Health

Life expectancy in years

1877



Mozambique

Uganda

Sierra Leone

1810

1877

1709

Income

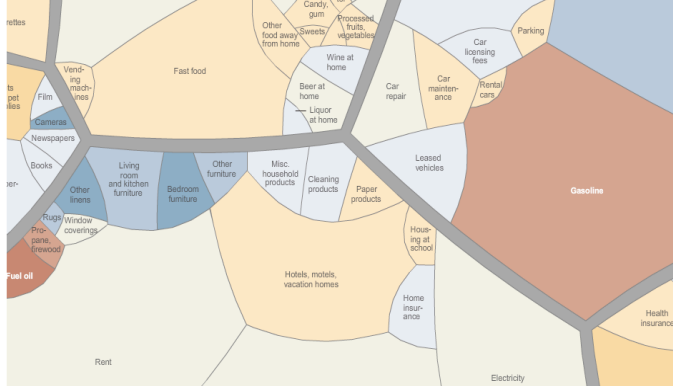
GDP per capita in US\$

# Narrative Devices for Storytelling with Data

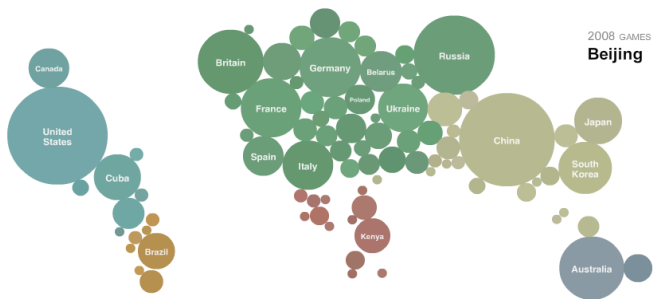
What devices communicate effectively?

... for which contexts and audiences?

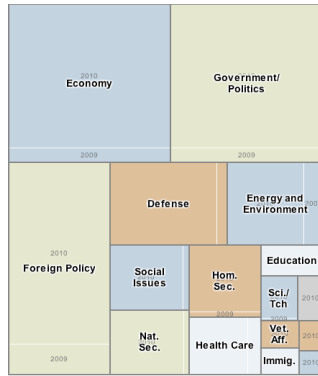
# Narrative Visualization Design Space



GEOGRAPHIC VIEW BY RANKING  
1896 1900 1904 1908 1912 1920 1924 1928 1932 1936 1948 1952 1956 1960 1964 1968 1972 1976 1980 1984 1988 1992 1996 2000 2004 2008



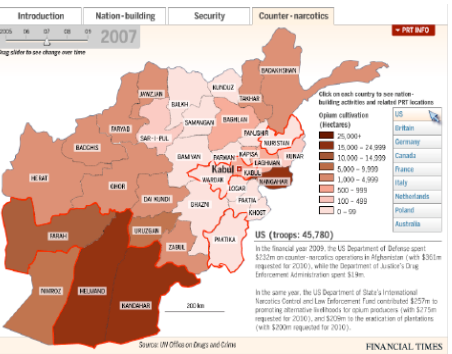
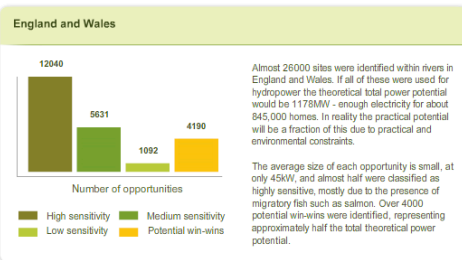
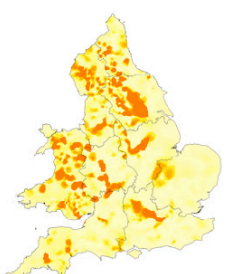
2008 Medal Count



# 58

## CASE STUDIES

- 70% Journalism
- 20% Business
- 10% Research

# 755

Grab attention with image and position



Line chart showing cumulative home runs.

**Hank Aaron**  
755 homers  
23 seasons



**Babe Ruth**  
714 homers  
22 seasons



**Barry Bonds**  
708 homers  
20 seasons

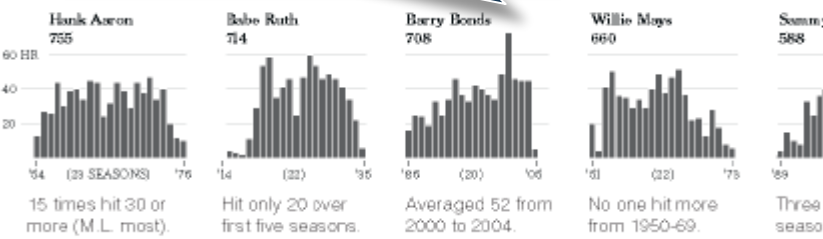
**Bonds takes lead**  
Home runs after 16 seasons  
Bonds 567  
Aaron 554  
Ruth 516

Major concern

According to a book, he began using steroids in the 1990s, league-wide later, he runs, su career p

Reduced visual priority

Differing Paths to the Top of the List: The top seven players on the career home run list.

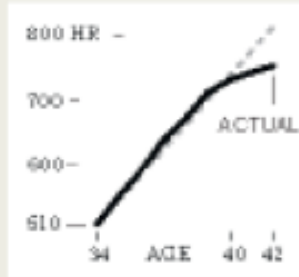


## Homer Pace After Age 34

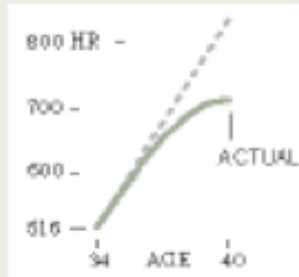
If the accusations are correct, Bonds was 34 in his first season on steroids. Here are projected home run paces for each player after age 34.

----- PROJECTED PACE BASED ON AVERAGE OF PREVIOUS FIVE SEASONS

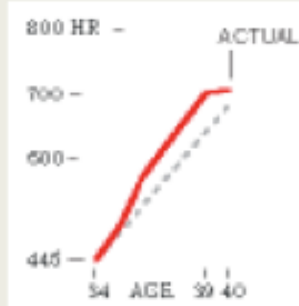
**Aaron**  
Actual homers slightly outpace projected homers for five seasons.



**Ruth**  
Averaged 46.4 homers a season from age 30 to 34. Averaged 42.5 for next four seasons.



**Bonds**  
From age 35 to 39, he averaged 14 more homers a season than projected.

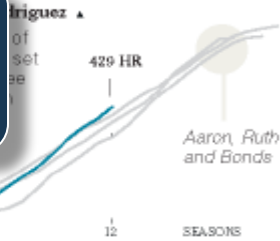


Note: Ages as of July 1 of each season.

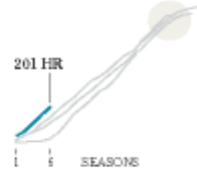
## Others Taking Aim



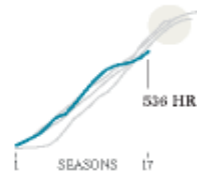
Pace



**Albert Pujols**  
Averaging 40 homers a season, he has started stronger than the three leaders did.

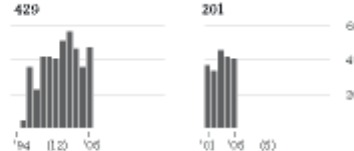


**Ken Griffey Jr.**  
Many thought he would be the first to catch Ruth and Aaron until injuries limited his output.



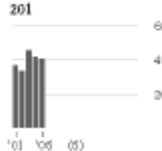
(257th).

**Alex Rodriguez**  
429



Youngest to reach 400 homers.

**Albert Pujols**  
201



Second most ever in first five seasons.



# Beginning

## Steroids or Not, the Pursuit Is On

Barry Bonds is taking aim at the career home run record. He needs only six seasons to tie Babe Ruth and 47 to equal Hank Aaron.

Line graph illustrating the projected home run totals for Hank Aaron, Babe Ruth, and Barry Bonds over time.

**Hank Aaron**  
755 homers  
23 seasons



**Babe Ruth**  
714 homers  
22 seasons



**Barry Bonds**  
708 homers  
20 seasons

**Bonds takes lead**  
Home runs after 16 seasons  
Bonds 567  
Aaron 554  
Ruth 511

14th season

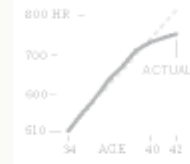
According to allegations in a book about Bonds, he began taking steroids before the 1999 season, his 14th in the league. Two seasons later, he hit 73 home runs, surpassing Aaron's career pace.

### Homer Pace After Age 34

If the accusations are correct, Bonds was 34 in his first season on steroids. Here are projected home run paces for each player after age 34.

----- PROJECTED PACE BASED ON AVERAGE OF PREVIOUS FIVE SEASONS

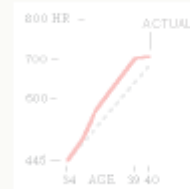
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**Bonds**  
From age 35 to 39, he averaged 14 more homers a season than projected.



# Middle

## Others Taking Aim



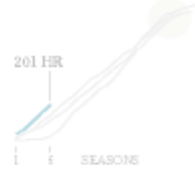
### Alex Rodriguez

Is ahead of the pace set by all three home run leaders.



### Albert Pujols

Averaging 40 homers a season, he has started stronger than the three leaders did.



### Ken Griffey Jr.

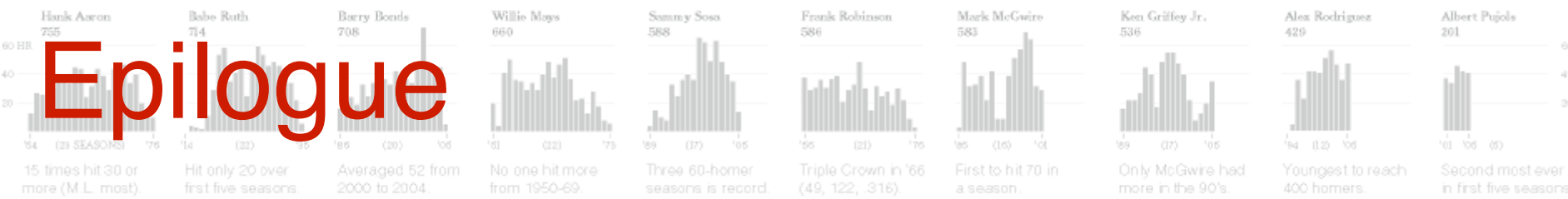
Many thought it would be the first to catch Ruth and Aaron until injuries limited his output.



# End

## Differing Paths to the Top of the Charts

The top seven players on the career home run list, along with a look at Griffey (12th), Rodriguez (37th) and Pujols (tied 257th).



# Epilogue

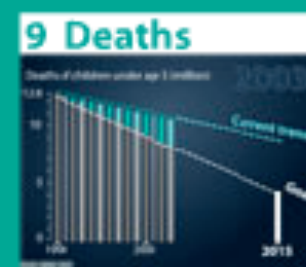
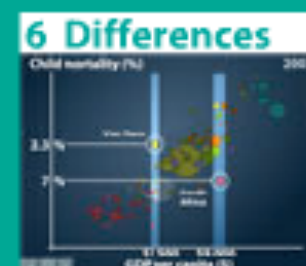
# Human Development Trends 2005



Interactive presentation of some of the messages in the Human Development Report 2005



English  
Dansk  
Portuguese  
Suomi  
Français  
Deutsch



Produced in collaboration with:  
**GAPMINDER**  
[www.gapminder.org](http://www.gapminder.org)

English translation: Claes Johansson, UNDP



Start




Establishing Shot

# Development Trends 2005

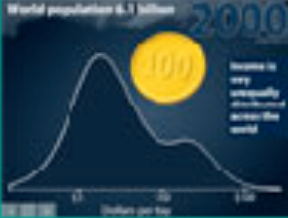


Checklist Structure

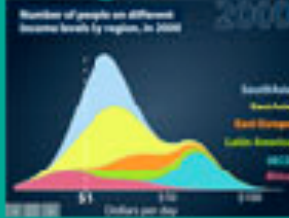
Interactive presentation of some of the messages in the Human Development Report



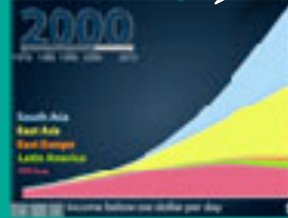
**1 Income**  
World population 6.1 billion  
2000  
Income is very unequally distributed across the world




**2 Regions**  
Number of people on different income levels by region, in 2000  
2000  
South Asia  
East Asia  
Latin America  
OECD  
Sub-Saharan Africa



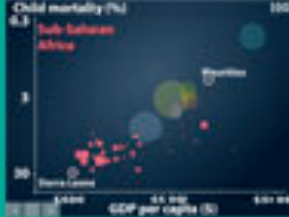
**3 Poverty**  
2000  
South Asia  
East Asia  
Latin America  
OECD  
Sub-Saharan Africa  
Income below one dollar per day



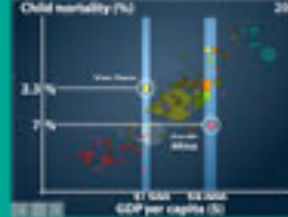
**4 Health**  
2003  
South Asia  
East Asia  
East Europe  
Latin America  
OECD  
Sub-Saharan Africa




**5 Countries**  
Child mortality (%)  
2003  
Sub-Saharan Africa  
OECD  
East Asia  
Latin America  
South Asia



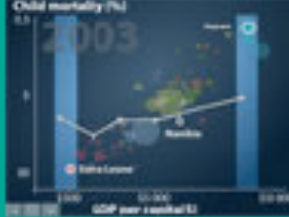
**6 Differences**  
Child mortality (%)  
2003  
OECD  
East Asia  
Latin America  
South Asia  
Sub-Saharan Africa




**7 Trends**  
Child mortality (%)  
2003  
OECD  
East Asia  
Latin America  
South Asia  
Sub-Saharan Africa




**8 Gaps**  
Child mortality (%)  
2003  
OECD  
East Asia  
Latin America  
South Asia  
Sub-Saharan Africa



**9 Deaths**  
Deaths of children under age 5 (million)  
2003




Produced in collaboration with:  
  
...der.org

English translation: Claes Johansson, UNDP

English  
Dansk  
Portuguese  
Suomi  
Français  
Deutsch

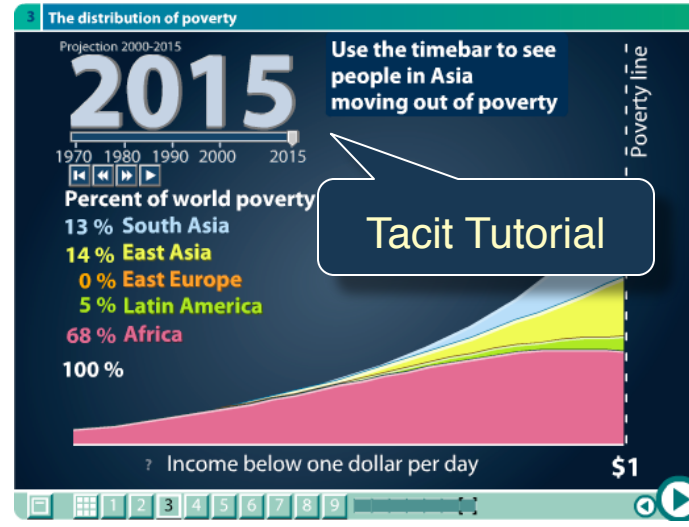
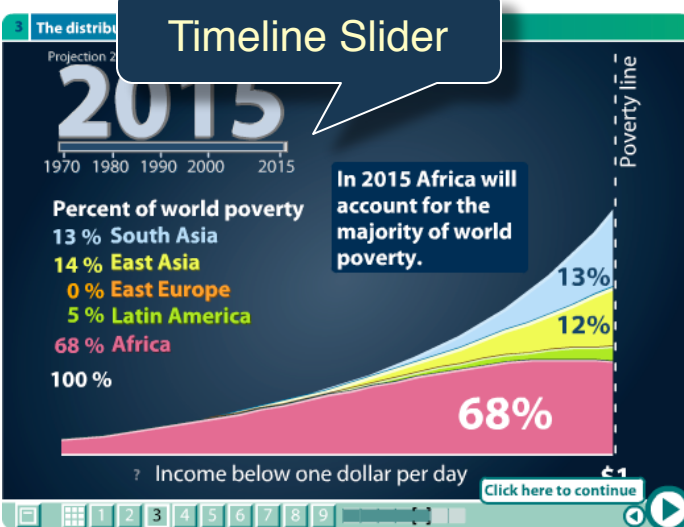
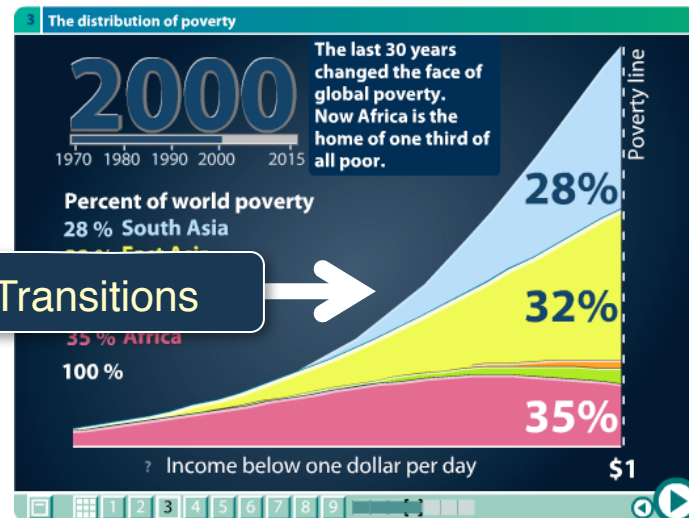
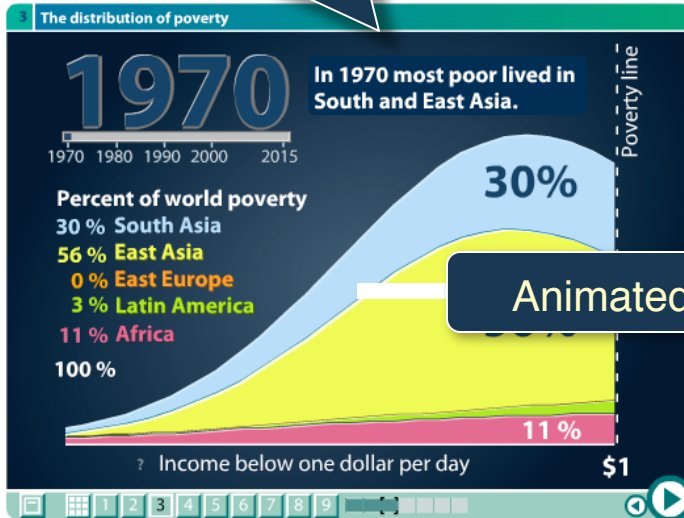
Progress Bar

Start 

Progress Bar

Cue to Action

# Annotations Tell Story



# Interactive Slide Show

# Budget 2010: reaction from around the UK

People in key constituencies around the country give their responses to Alistair Darling's budget

by **Andy Ridley** and **Carly Lev**  
Wednesday 24 March 2010 15:00 GMT

**Smith and Fulham**



**Shilpa Wymer**, 40, is managing director of two branches of Pitman Training Ltd, a training school specialising in secretarial and PA training

Enquiries from individuals suddenly dropped off a cliff from October 2008 and in January last year we had to lay off a couple of people, though things have picked up since. The budget seems very positive and shows the government are thinking about small and medium sized businesses at last. I think the measures will help businesses be more confident, which will have a knock-on effect on us. It has turned my head and made me think about which way I will vote.

## Constituency profile

MP: Greg Hands, Conservative. Majority: 5,029  
Unemployment benefit claimants, Feb 2010: 3,281 (up 13% over last year)

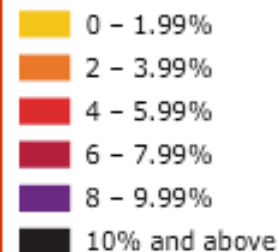
Introductory Text

Consistent Visual Platform

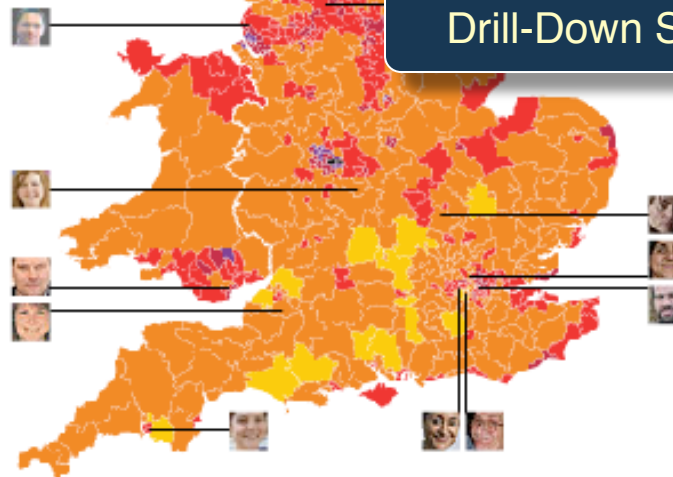
Anecdotal Stories with Data Stories

## Key

Unemployment benefit claimant count, February 2010

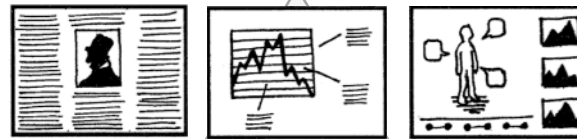


Drill-Down Story





# Visual Design



MAGAZINE  
STYLE

ANNOTATED  
CHART

SCIENCE FAIR  
POSTER



FLOWCHART

COMICSTRIP

SLIDESHOW

MOVIE

Duo-Specific

Captions

Annotations

Attached  
Article

Summaries

Interpret

Headlines

Tacit  
Tutorial

Selection

Navigation

Details on  
Demand

Timelines

Filtering

Highlighting

## Messaging

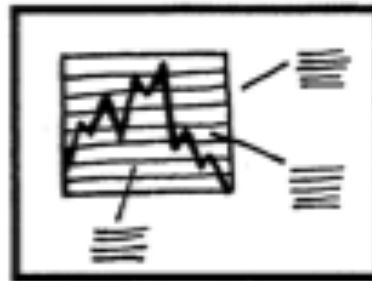
## Interactivity

MORE

# Seven Genres



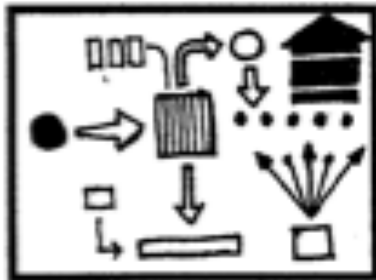
Magazine Style



Annotated Chart



Partitioned Poster



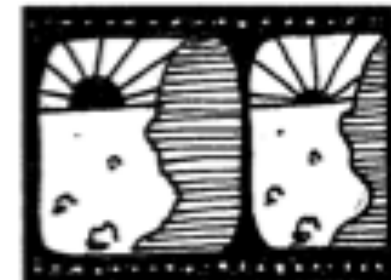
Flow Chart



Comic Strip



Slide Show



Film/Video/Animation

## Genres for Narrative Visualization (2010)

*Missing "scrolly-telling" designs...*



# Genres + Interactivity + Messaging =

# DESIGN SPACE

STORYTELLING

CLARITY

SPEED

## Author Driven

strong ordering  
heavy messaging  
limited interactivity

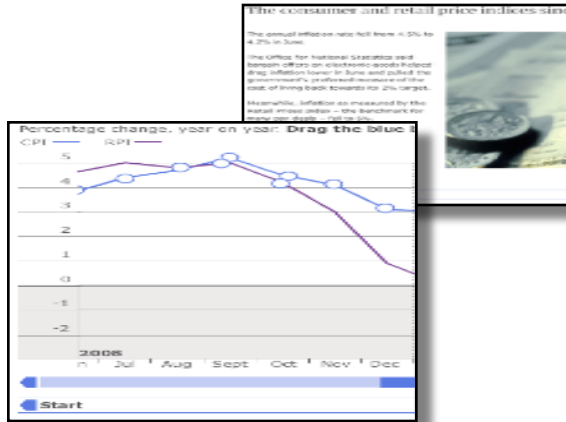
## Reader Driven

weak ordering  
light messaging  
free interactivity

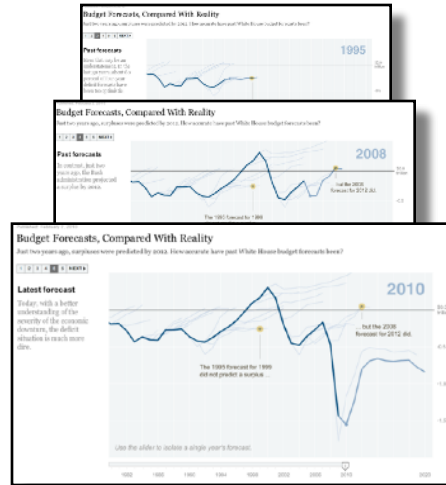
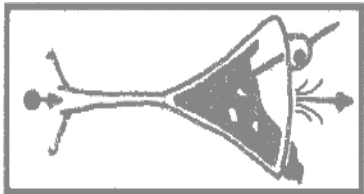
ASK QUESTIONS

EXPLORE

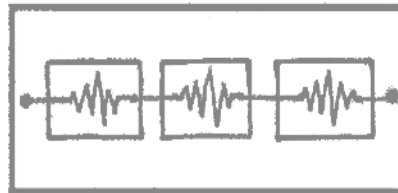
FIND



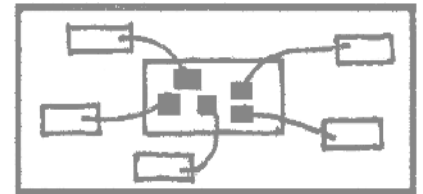
martini glass



interactive slideshow






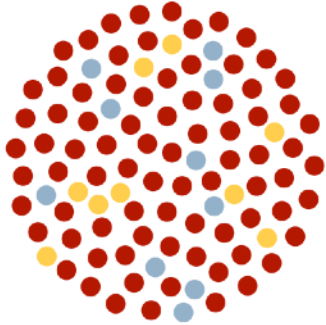
drill-down story



**Other techniques:  
simulation, games,  
rhetorical, draw the trend**

# Watch how the measles outbreak spreads when kids get vaccinated – and when they don't

 vaccinated    susceptible    vaccinated but susceptible    infected    contact with an infected person



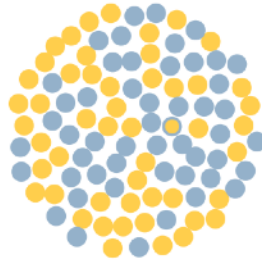
NOT PROTECTED

10.0% vax rate

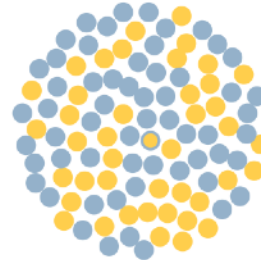


NOT PROTECTED

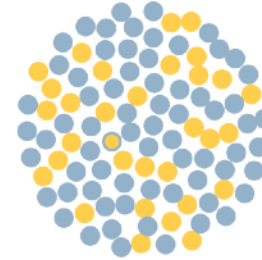
30.0% vax rate



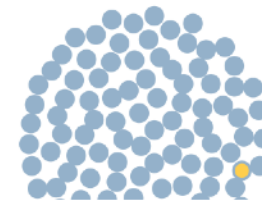
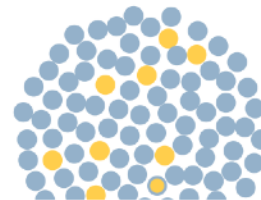
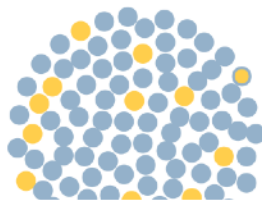
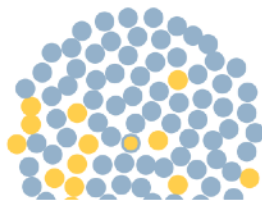
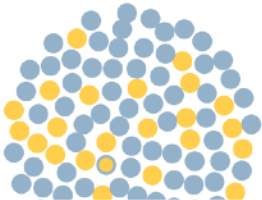
50.0% vax rate



58.5% vax rate, similar to Okanagan County, WA



68.9% vax rate, similar to Thurston County, WA



# Who Should Get Parole?

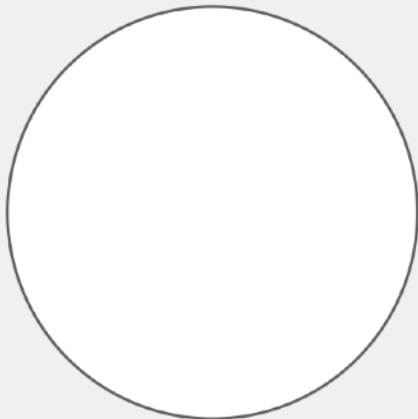
Even the best risk assessments yield probabilities, not certainties. That means they label as “high risk” some people who won’t commit another crime and label as “low risk” some people who will. This simulation lets you sort offenders into risk categories based on the results of an assessment. Think we should rarely lock up anyone who wouldn’t reoffend? Set the “low risk” threshold high and the “high risk” threshold even higher. Have little tolerance for recidivism? Try the opposite. In the real world, policymakers have to strike a balance. [Read more »](#)

1

The prisoners in this simulation are up for parole. Some will reoffend if released and some won't. They each take an assessment, which estimates the chance they will reoffend.

Start

PAROLE-ELIGIBLE PRISONERS



2

Prisoners are placed in one of three categories based on these estimates. **Move the slider** to change the cutoffs for each category. “Low risk” prisoners will be awarded parole. “High risk” prisoners will be denied.



LOW RISK

MEDIUM RISK

HIGH RISK

3

Some people you let out reoffended. Some people you left in prison wouldn't have. **Are you OK with the results?**

AWARDED PAROLE

0%  
AWARDED PAROLE AND  
THEN REOFFENDED

DENIED PAROLE

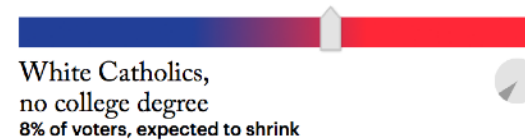


**D 48.1%**



**R 44.2%**

Change voters' political loyalties to build a winning coalition.

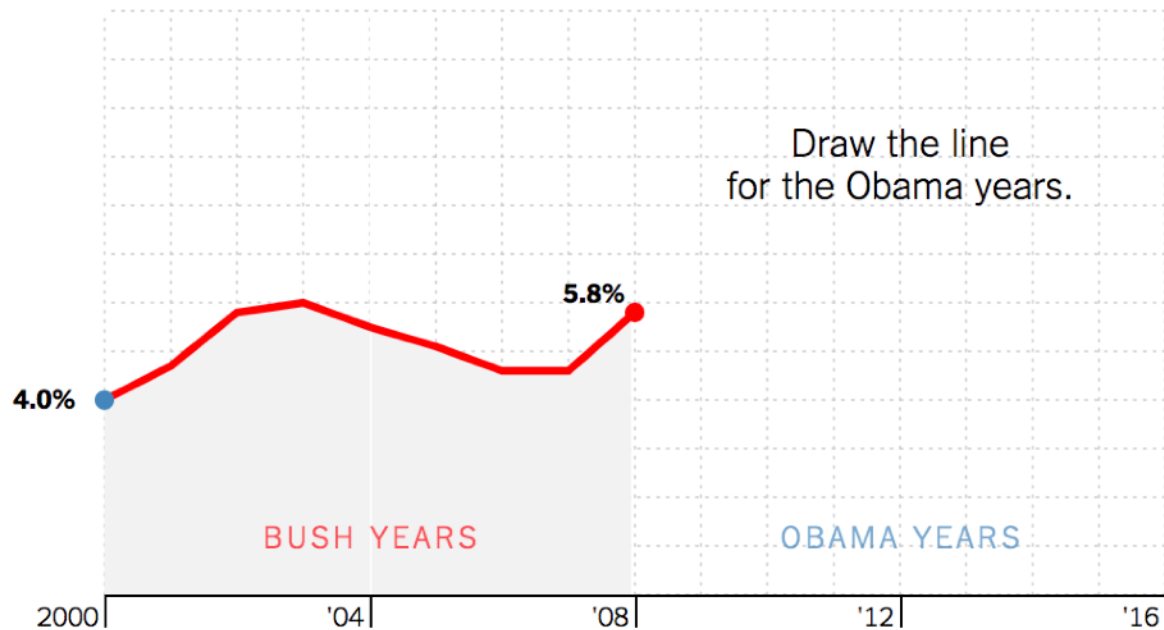


# You Draw It: What Got Better or Worse During Obama's Presidency

By LARRY BUCHANAN, HAEYOUN PARK and ADAM PEARCE JAN. 15, 2017

Draw your guesses on the charts below to see if you're as smart as you think you are.

Under President Obama, the **unemployment rate** ...



Show me how I did.

# Blue Feed, Red Feed

See Liberal Facebook and Conservative Facebook, Side by Side

By Jon Keegan

Published May 18, 2016 at 8:00 a.m. ET | Updated hourly

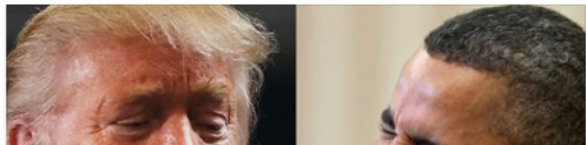
FILTER FEEDS BY TOPIC:

- PRESIDENT TRUMP
- HEALTH CARE
- GUNS
- ABORTION
- ISIS
- BUDGET
- EXECUTIVE ORDER
- IMMIGRATION

LIBERAL **SHOWING POSTS ABOUT: "HEALTH CARE"** CONSERVATIVE


**Occupy Democrats** 2 hours ago

The president thought he could undo his predecessor's legacy, but his plan isn't exactly panning out.



**The Federalist Papers** 9 hours ago

A horrible testament to what happens with government-run healthcare systems.



These Facebook posts do not represent the reporting or opinion of The Wall Street Journal, and are not verified, edited or endorsed in any way. Read our [Methodology](#).



# Interactive Documents: Steppers, Scrollers, ...

Published: February 2, 2010

# Budget Forecasts, Compared With Reality

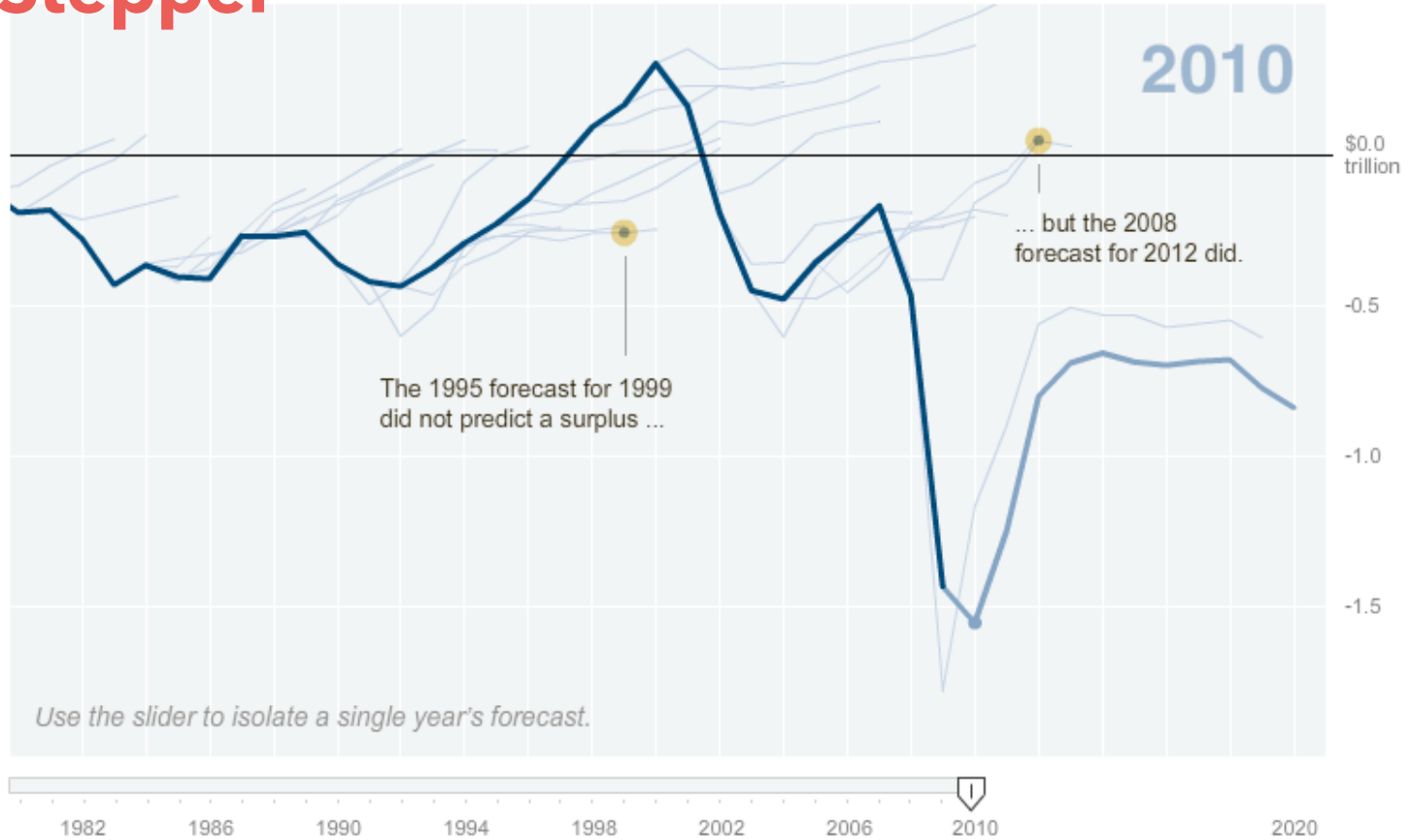
Just two years ago, surpluses were predicted by 2012. How accurate have past White House budget forecasts been?

1 2 3 4 5 6 NEXT ▶

## Latest forecast

Today, with a better understanding of the severity of the economic downturn, the deficit situation is much more dire.

# Stepper



### Ramadi: The Government Provides an Opening for ISIS **ISIS Control**

Tensions between this city's residents, who are mostly Sunni, and the central government had been brewing here for at least a year. Then in December, Iraq's prime minister, Nuri Kamal al-Maliki, ordered security forces to dismantle a protest camp — an outlet for disenchanted Sunnis angered at their treatment by the Shiite-dominated government. The action ignited days of violence and created the opening ISIS needed to seize parts of the city, the provincial capital.

Lake Tharthar

### Falluja: A Symbolic Fall **ISIS Control**

Just days after the raid on the camp in Ramadi, ISIS fighters destroyed the Police Headquarters and mayor's office here, planted their flag on government buildings and decreed the city to be theirs. Ten years earlier, American forces had captured this city from Qaeda-style insurgents at a considerable cost of American lives.

Lake Habbaniya

Balad



17 MILES TO BAGHDAD

Scroll



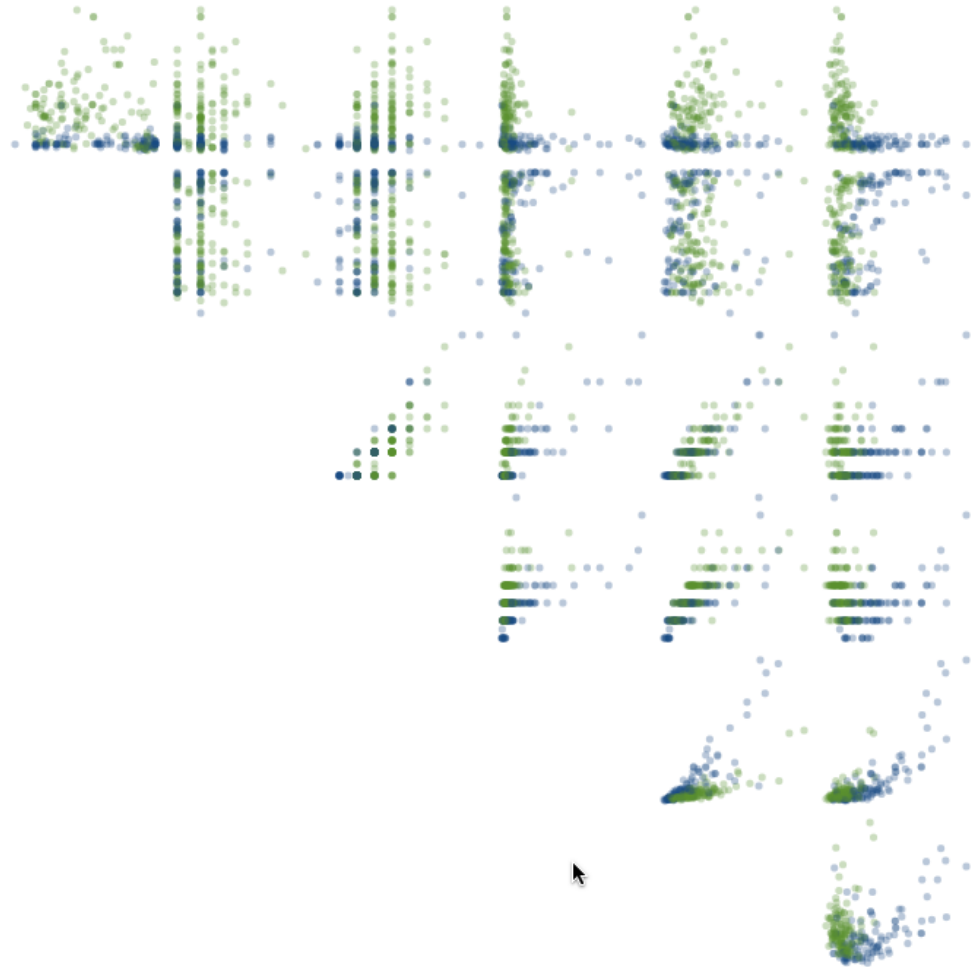
R2  
D3

# A visual introduction to machine learning

English

In machine learning, computers apply **statistical learning** techniques to automatically identify patterns in data. These techniques can be used to make highly accurate predictions.

*Keep scrolling.* Using a data set about homes, we will create a machine learning model to distinguish homes in New York from homes in San Francisco.



# Discrete step vs. Continuous scroll

Different means for narrative navigation.  
A source of debate among practitioners!

# Discrete step vs. Continuous scroll

Different means for narrative navigation.  
A source of debate among practitioners!

**Step:** sequential frames as in a slideshow  
Simple and familiar, but less engaging?

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Different means for narrative navigation.  
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**Step:** sequential frames as in a slideshow  
Simple and familiar, but less engaging?

**Scroll:** continuous navigation of page  
Parameterize content by scroll position  
May cause usability / scrolljacking issues

# Discrete step vs. Continuous scroll

Different means for narrative navigation.  
A source of debate among practitioners!

**Step:** sequential frames as in a slideshow  
Simple and familiar, but less engaging?

**Scroll:** continuous navigation of page  
Parameterize content by scroll position  
May cause usability / scrolljacking issues

**Hybrids:** scroller with discrete sections



# Narrative Implementation

## **Do-It-Yourself**

Monitor scroll position & element positions

Guidance: M. Bostock, J. Vallandingham

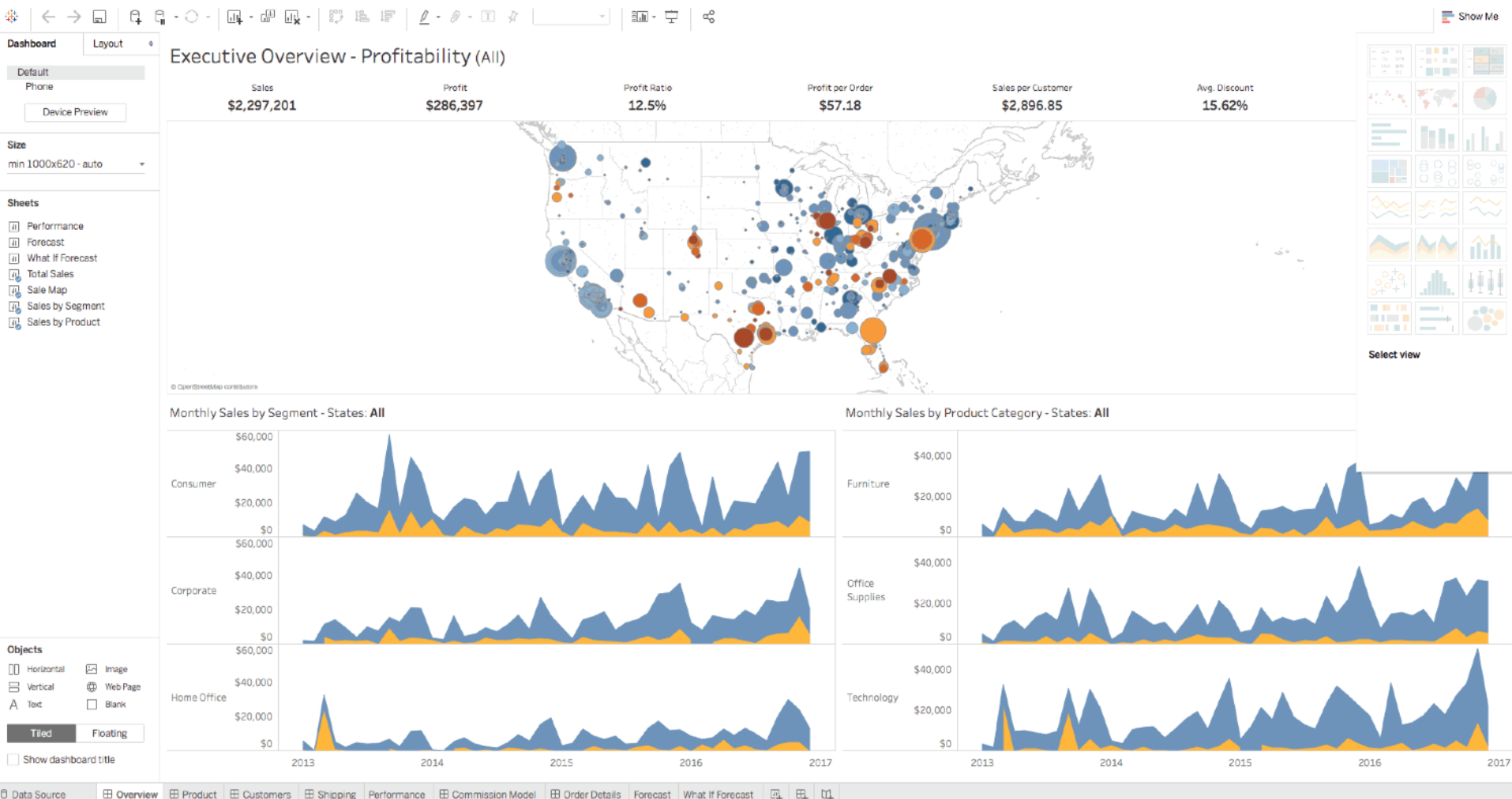
## **Third-Party Support**

Helper Libraries

Interactive Document Formats: Idyll

# Chart Sequence Models

# Multiple Charts in Data Analysis



# Multiple Charts in Story Telling

## Copenhagen: Emissions, Treaties and Impacts


At the Copenhagen climate conference, discussions are likely to cover emissions levels, the legacy of the Kyoto Protocol and the risks of inaction on global warming. Explore each issue in the tabs below.

Global Emissions      Lessons From Kyoto      Possible Impact

1 2 3 4 5 6 7 8 9 10 11 NEXT ▶

Almost every country in the world signed and ratified the protocol. The treaty's aim was to provide a starting point for reducing global carbon dioxide emissions.

**Countries that ratified Kyoto**

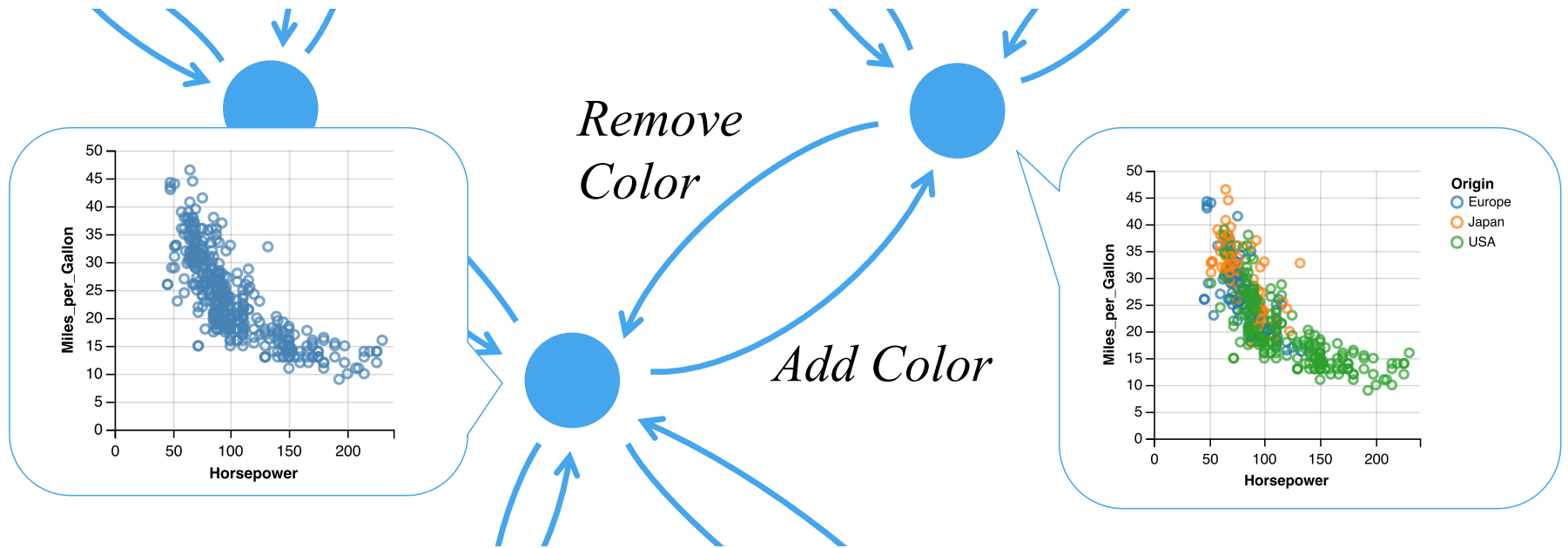


*Roll over countries to learn more*

**In many cases, data is conveyed  
via a sequence of charts.**

**How might we evaluate different  
orderings of visualizations?**

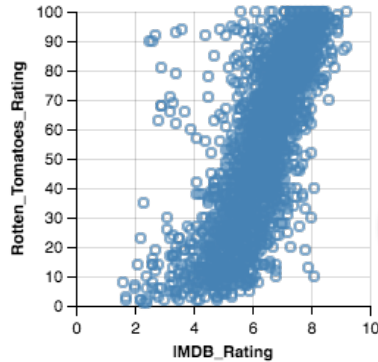
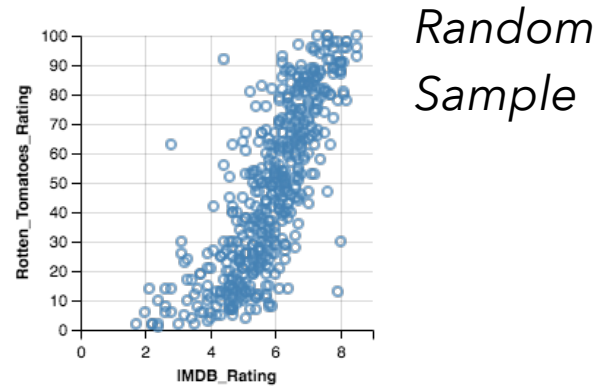
# GraphScape: A Directed Graph Model



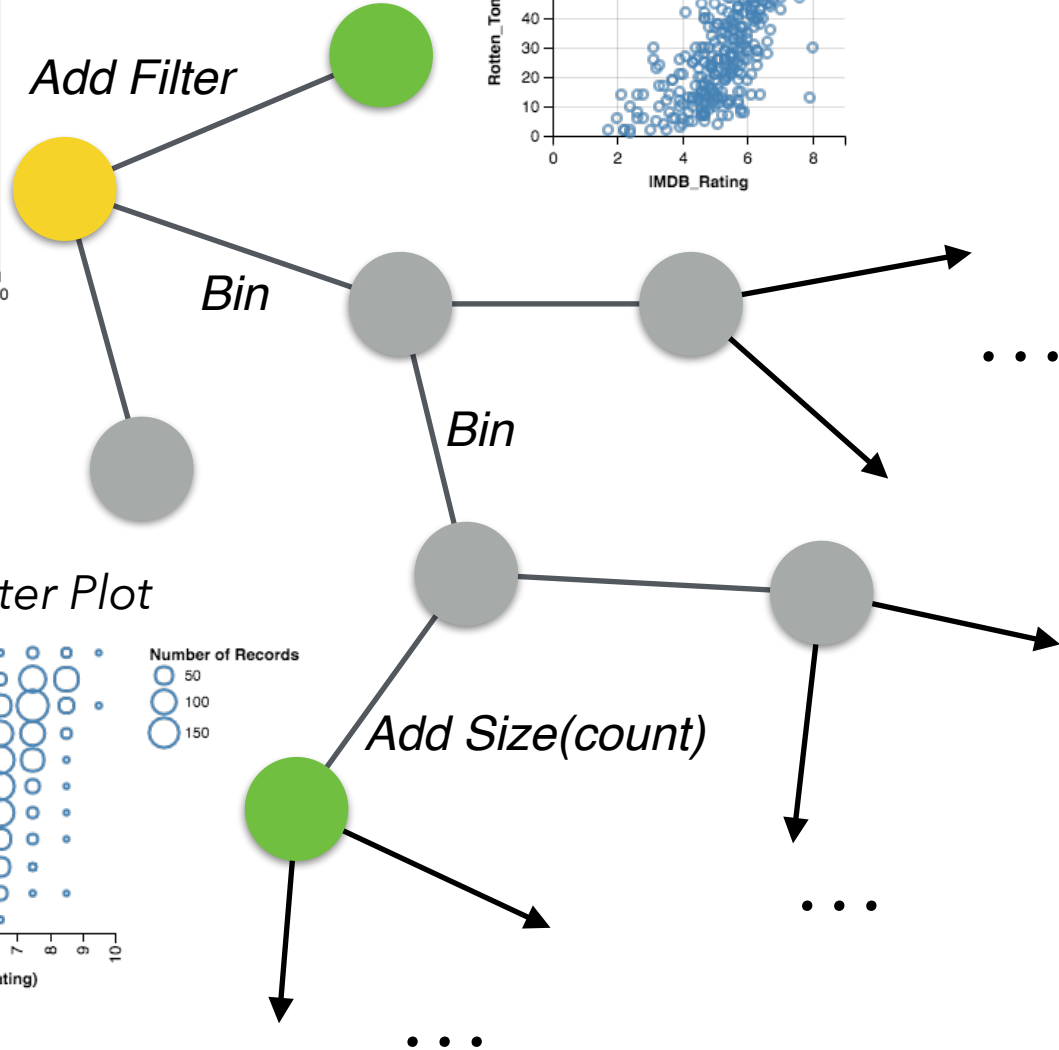
Nodes are Vega-Lite specifications. Edges represent **edit operations**, weighted by estimated **transition costs**.

# Design Alternatives

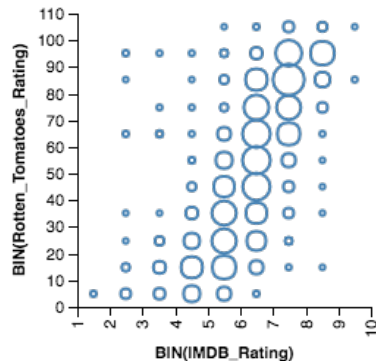
"Too many data points !"



Add Filter

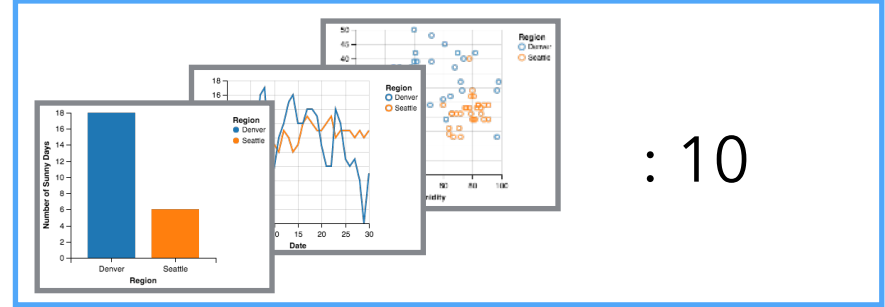
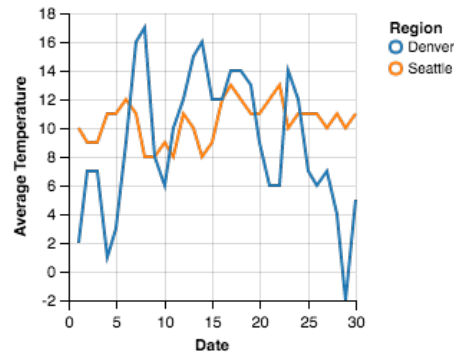
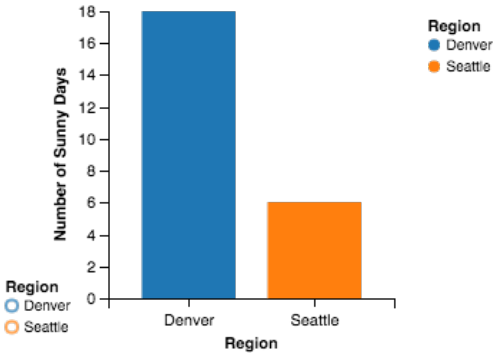
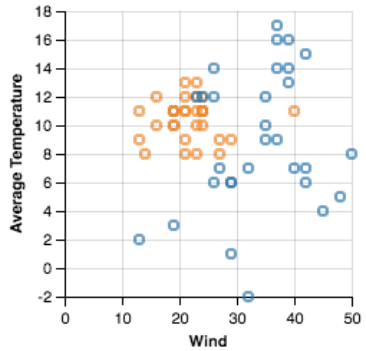


Binned Scatter Plot

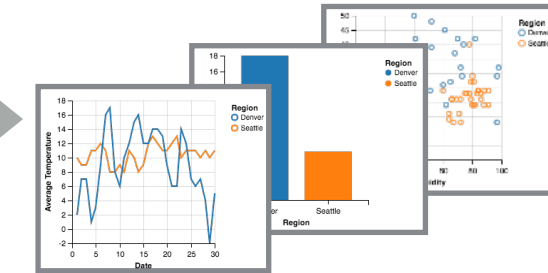


# Sequence Recommendation

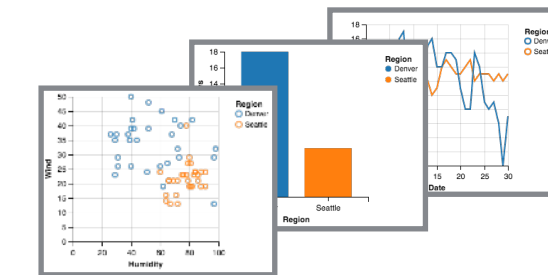
Sequence  
Cost



: 10



: 12



: 13

...



# GraphScape

Previously we've discussed approaches for automatic design of a **single visualization**.

GraphScape supports automated design methods for **collections of visualizations**.

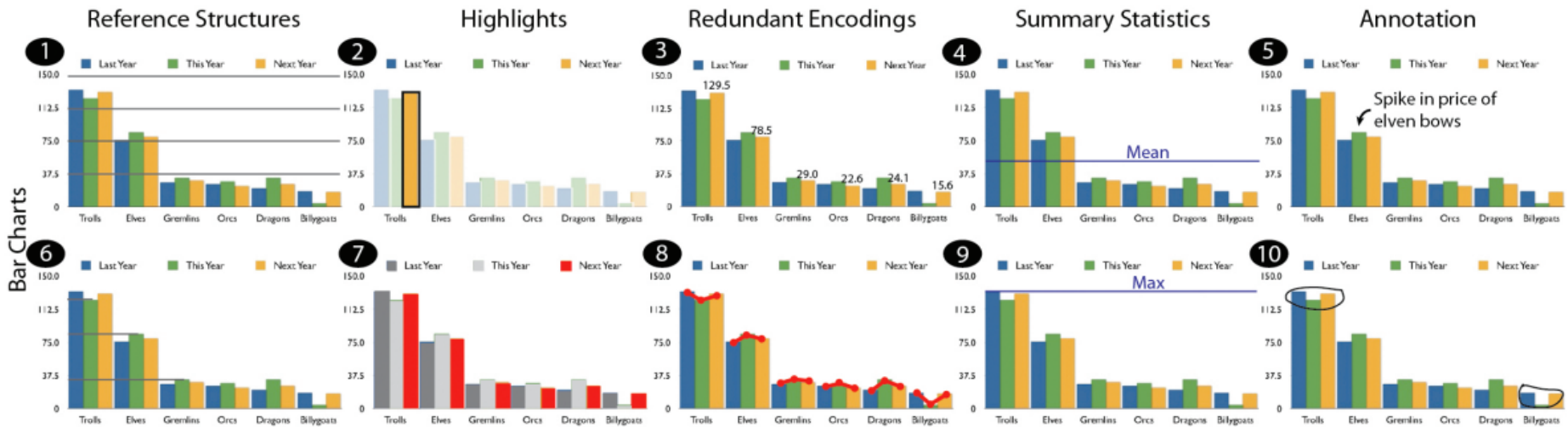
Plenty of future work to do here!

# Automatic Augmentation of Charts for Communication

**Given existing visualizations, can we adapt them to communicate more effectively?**

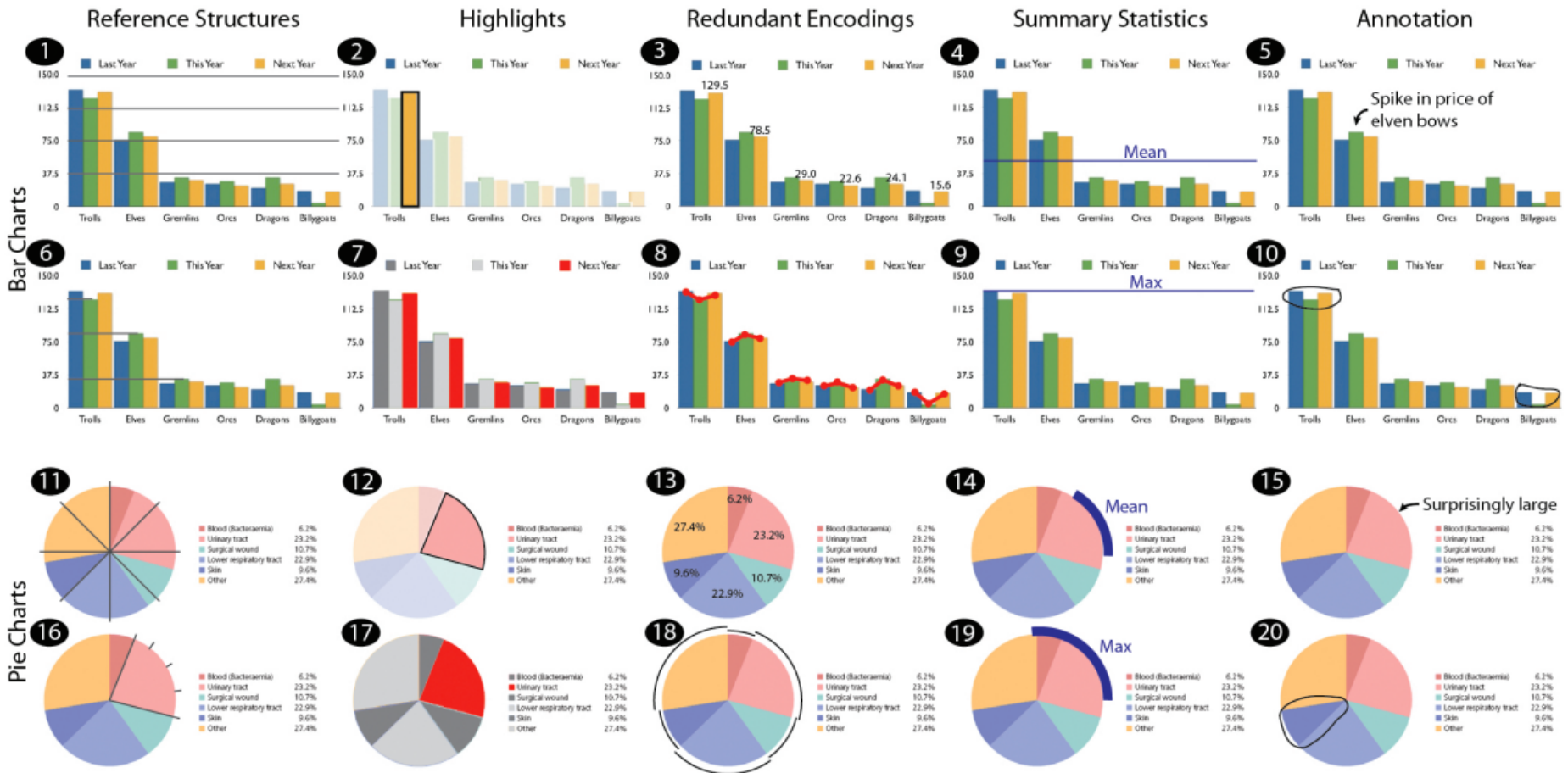
# Graphical Overlays [Kong et al. '12]

Add (interactive) reading aids to bitmap charts!



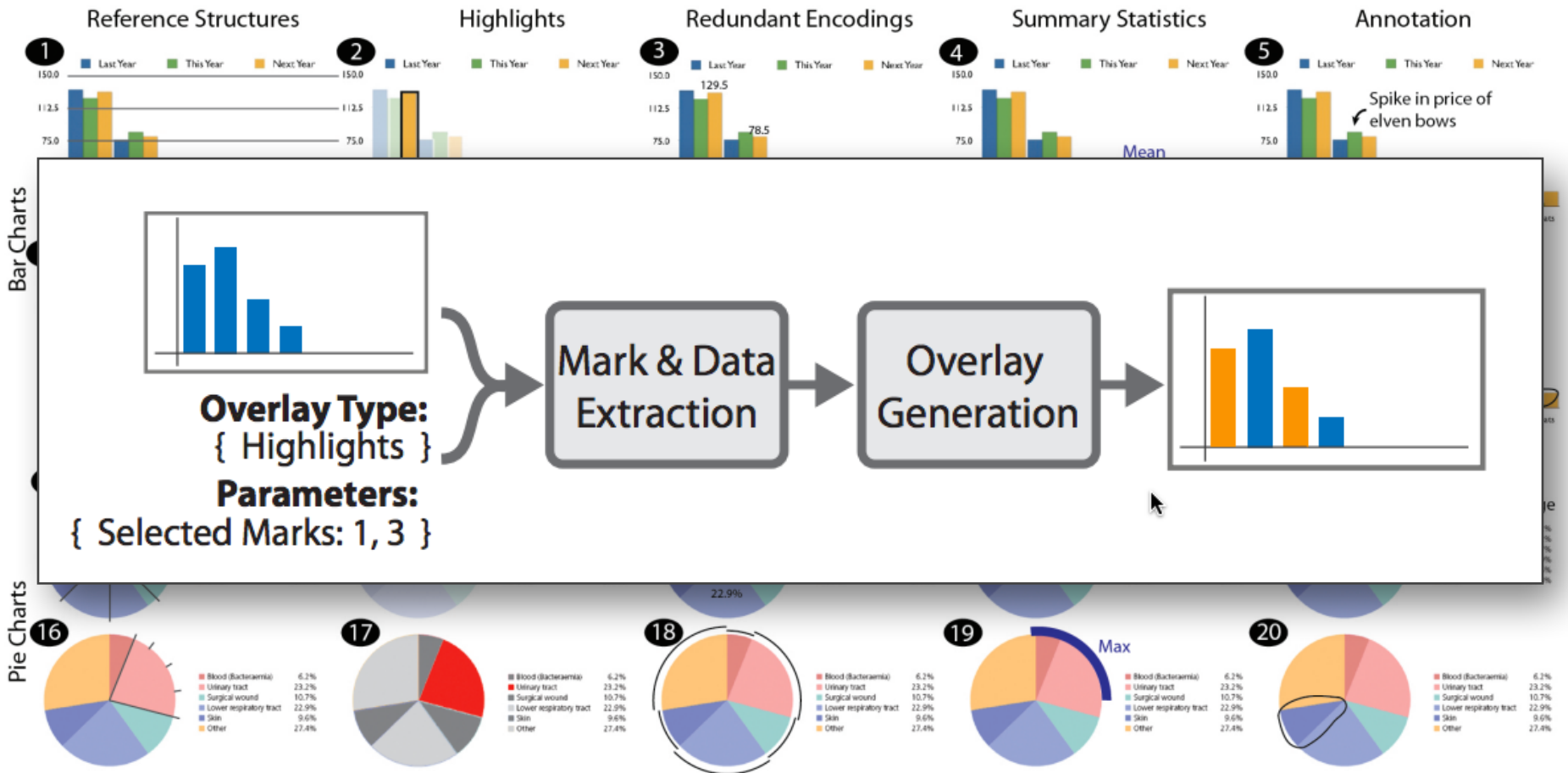
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# Annotated Visualizations in News

The New York Times

Business Day  
Technology

Search All NYTimes.com

Orange Savings Account™

WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH SPORTS OPINION ARTS STYLE TRAVEL JOBS REAL ESTATE

AUTOS

Search Technology

Inside Technology

Bits Blog »

Personal Tech »

Internet | Start-Ups | Business Computing | Companies

Digital Cameras | Cellphones | ALL PRODUCTS

## Apple Passes Microsoft as No. 1 in Tech

By MIGUEL HELFT and ASHLEE VANCE  
Published: May 26, 2010

SAN FRANCISCO — Wall Street has called the end of an era and the beginning of the next one: The most important technology product no longer sits on your desk but rather fits in your hand.



Jim Wilson/The New York Times  
Apple fans crowded the iPad demo area at the company's downtown San Francisco store.

The moment came Wednesday when [Apple](#), the maker of iPods, iPhones and iPads, shot past [Microsoft](#), the computer software giant, to become the world's most valuable technology company.

This changing of the guard caps one of the most stunning turnarounds in business history for Apple, which had been given up for dead only a decade earlier, and its co-founder and visionary chief executive, [Steven P. Jobs](#). The rapidly rising value attached to Apple by investors also heralds an important cultural shift: Consumer tastes have overtaken the needs of business as the leading force shaping technology.

Microsoft, with its Windows and Office software franchises, has dominated the relationship most people had with their computers for almost two decades, and that was reflected in its stock market capitalization. But the click-clack of the keyboard has ceded ground to the swipe of a finger across a smartphone's touch screen.

- RECOMMEND
- TWITTER
- LINKEDIN
- COMMENTS (240)
- E-MAIL
- PRINT
- REPRINTS
- SHARE



### Multimedia



Interactive Feature  
Apple and Microsoft's Tug of War

### Related

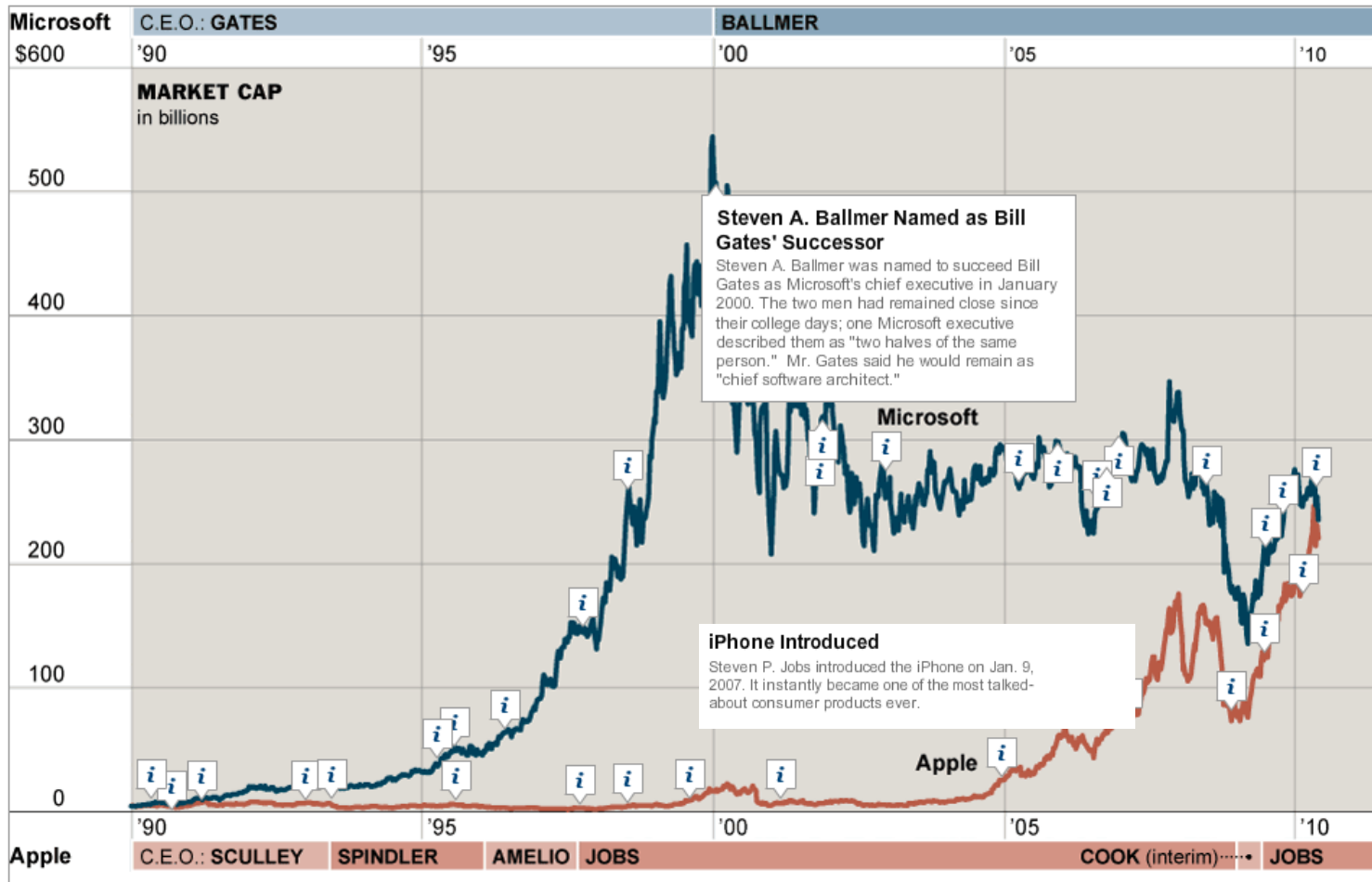
Times Topic: Apple Inc.

## Apple and Microsoft's Tug of War

Apple, the maker of iPods, iPhones and iPads, shot past Microsoft on May 26, 2010, supplanting the computer software giant as the world's most valuable technology company. This changing of the guard caps one of the most stunning turnarounds in business history for Apple, which had been given up for dead only a decade earlier. The rapidly rising value attached to Apple by investors also heralds an important cultural shift: Consumer tastes have overtaken the needs of business as the leading force shaping technology. [Related Article »](#)



# Annotations Tell a Story



Produced by Joshua Brustein and Danielle Belopotosky/The New York Times

Can we produce an automated solution?



# Contextifier System [Hullman et al.]

Input: news article about a company

TECHNOLOGY

## Yahoo Decides to Friend Facebook

By AMIR EFRATI  
Updated Feb. 15, 2011 12:01 a.m. ET

Yahoo Inc. +1.34% watched as social-networking website Facebook Inc. stole the attention of users and grabbed a major share of the online-advertising market.

Now the Internet pioneer is following an old mantra: If you can't beat 'em, join 'em.



Enlarge Image

CEO Carol Bartz is trying to grab more traffic for Yahoo through the company's recent ties with Facebook. *Bloomberg News*

After struggling for years to develop services that compete with the social network, Yahoo in recent months has installed tools such as Facebook's "Like" and "Share" buttons on its news and sports websites in order to help Yahoo users share articles with their contacts on Facebook, among other things.

Yahoo, like other content providers, is seeking to leverage Facebook's huge user base to draw more traffic back to Yahoo after readers click on the sharing buttons. The moves also are aimed at ensuring that links to Yahoo content appear in the search feature on Facebook's site. Yahoo is using similar approaches with Twitter Inc., the Internet messaging service, and Zynga Game Network Inc., which offers online social games.

