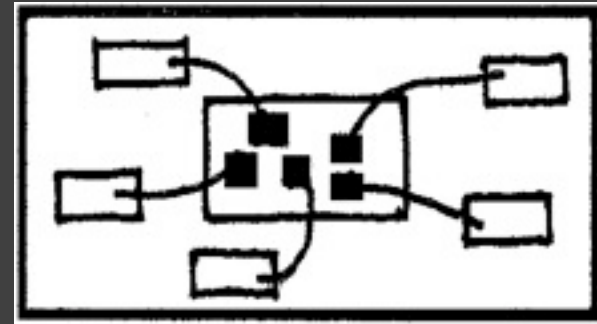
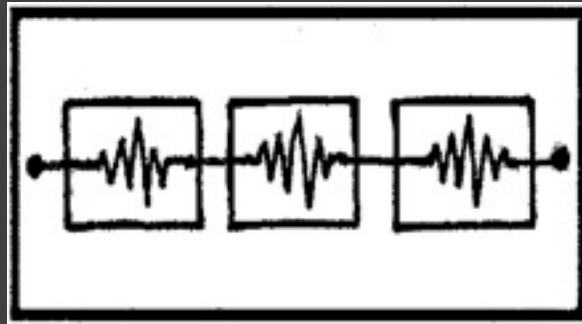
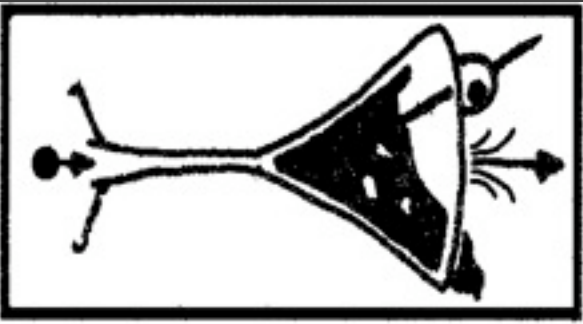


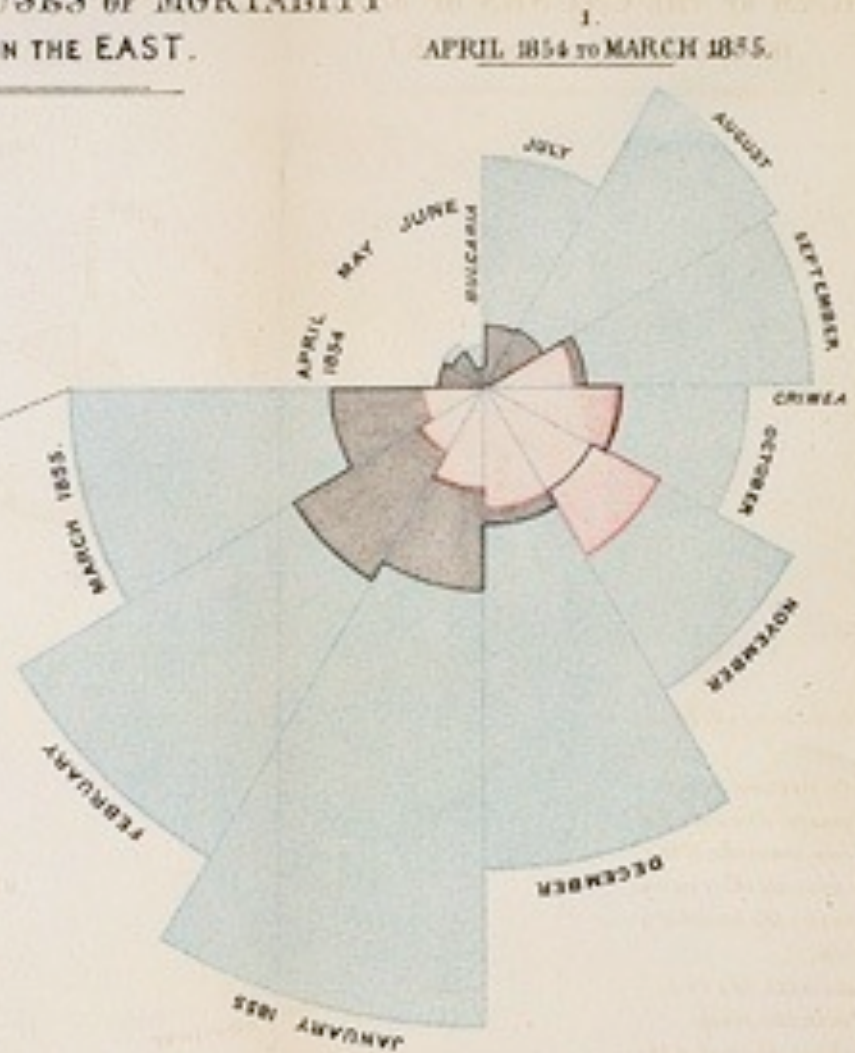
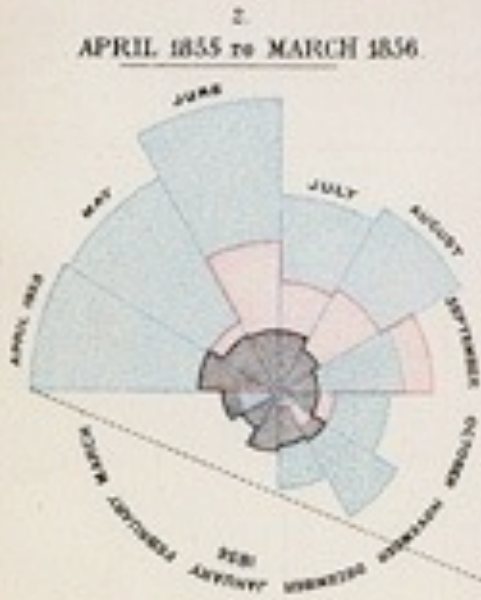
CSE512 :: 25 Feb 2014

Narrative Visualization



Jeffrey Heer University of Washington
(with material from Edward Segel)

DIAGRAM OF THE CAUSES OF MORTALITY IN THE ARMY IN THE EAST.



“to affect thro’ the
Eyes what we fail to
convey to the public
through their word-
proof ears”

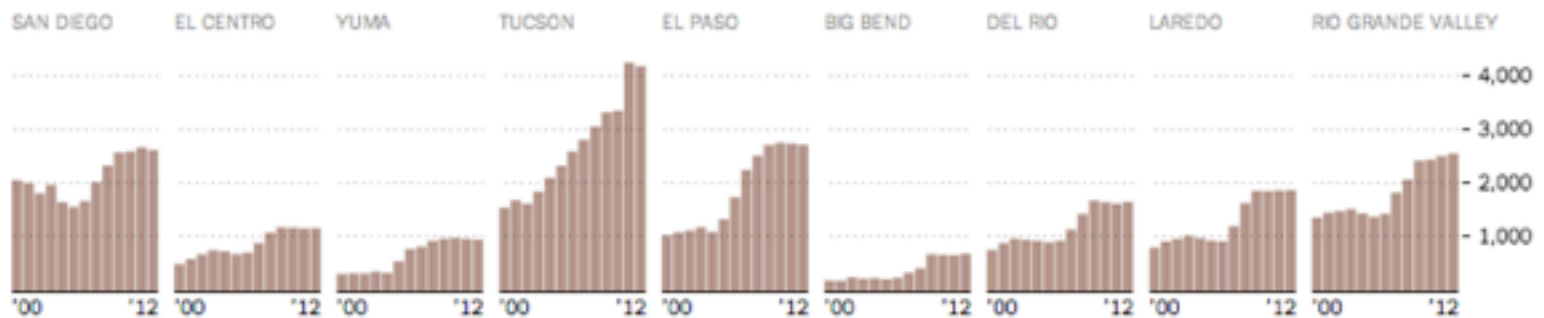
1856 “Coxcomb” of Crimean War Deaths, Florence Nightingale

Increased Border Enforcement, With Varying Results



There are now more agents along the 1,954 mile-long border than ever before...

Border agents per sector.



Satellite Projection, NY Times

How Obama Won Re-election

Whites Were Outvoted

Women

Hispanics

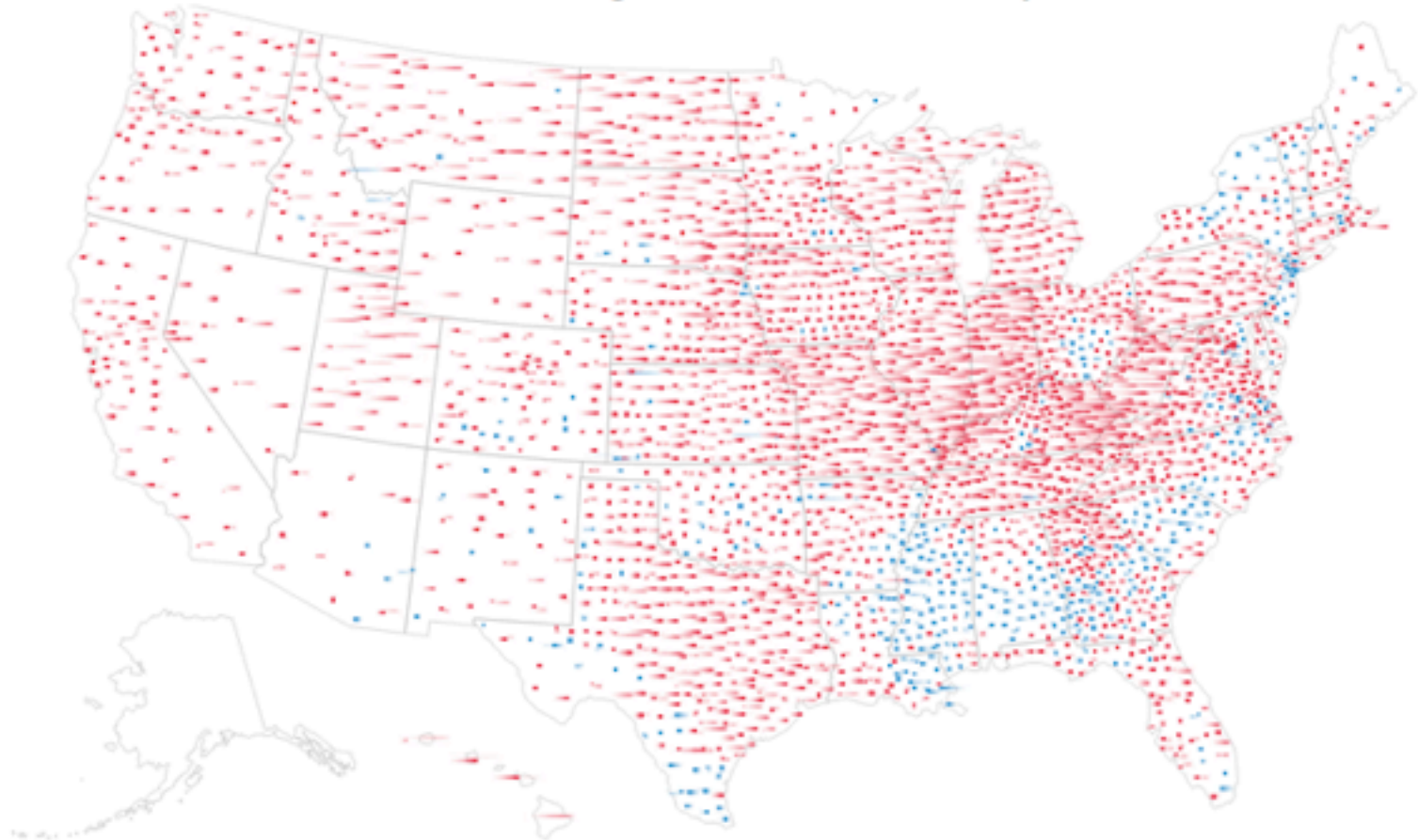
Youth

Romney's Shift Wasn't Enough

2008

2012

Most of the nation shifted to the right in Tuesday's vote, but not far enough to secure a win for Mitt Romney.



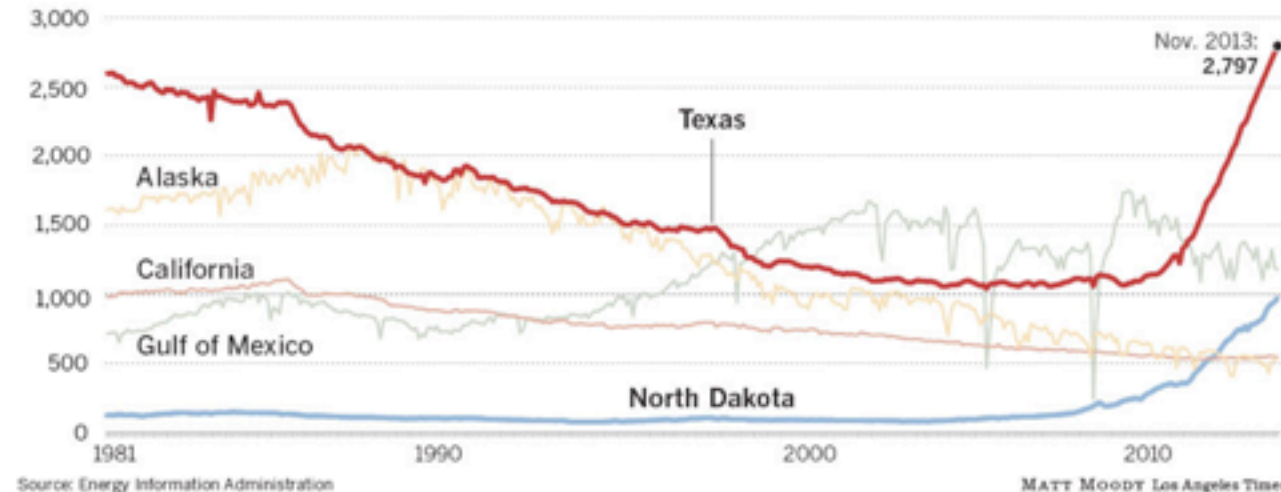
Texas oil boom is visible from space

Lighting and natural gas flares from drilling on the 400-mile-long Eagle Ford shale formation can be seen from space in this image.



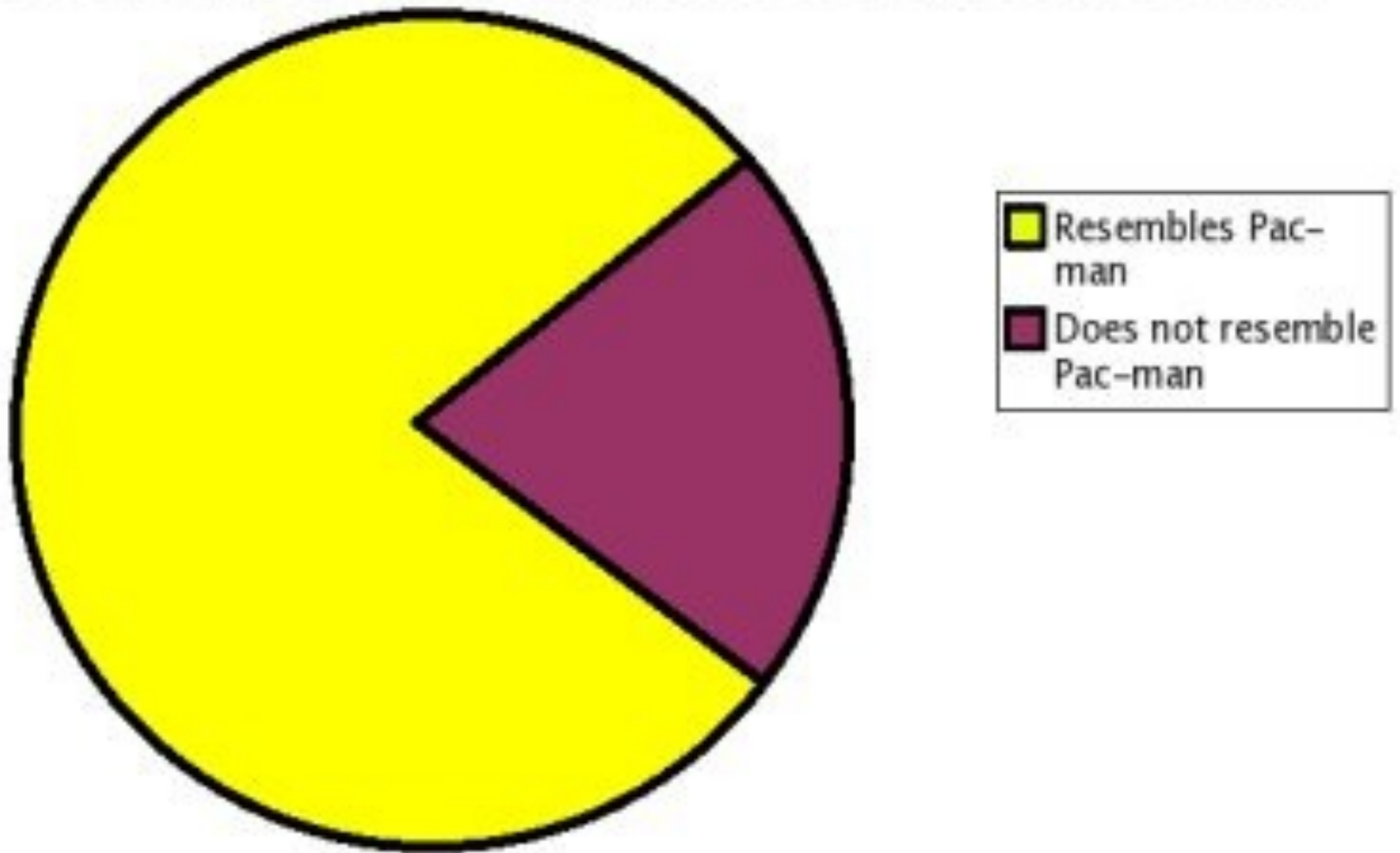
The new formation has helped make Texas the No. 1 oil-producing state in the nation.

Oil production from different U.S. regions (in thousands of barrels per day)

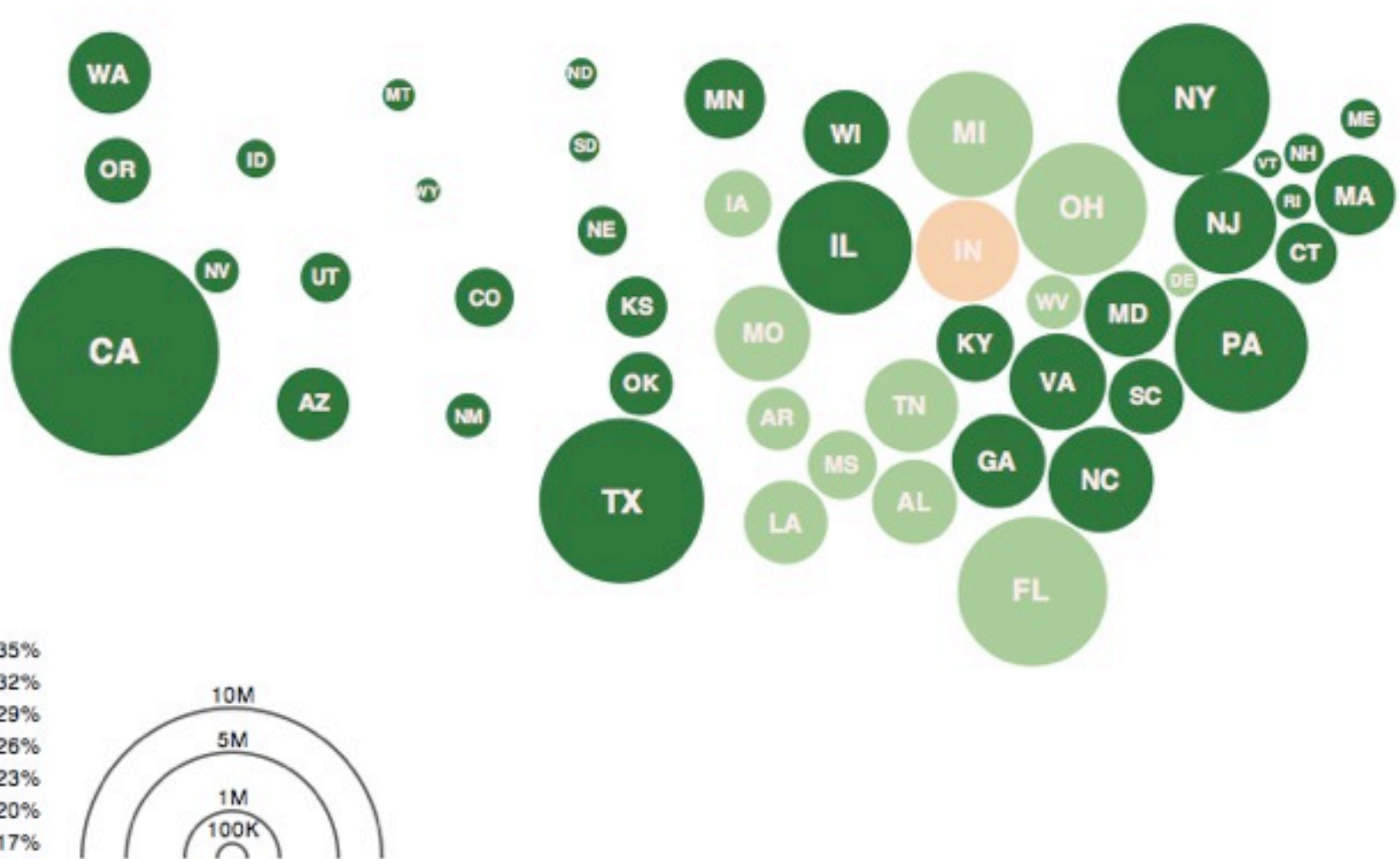


LA Times 2014

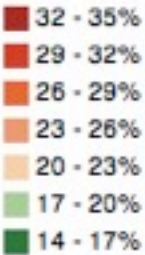
Percentage of Chart Which Resembles Pac-man



<http://www.boingboing.net/2006/11/02/hilarious-piechartvi.html>



Obesity Map Vadim Ogievetsky



8

Health

Life expectancy in years

1877

Uganda

Mozambique

Sierra Leone

1877

1810

1709

GDP per capita in US

Income



Narrative Devices for Storytelling with Data

What devices communicate effectively?

... for which contexts and audiences?

A

BRIEF

HISTORY

STORYTELLING

as ancient as mankind



STORYTELLING

changes with technology

PEOPLE TELL STORIES

WORDS TELL STORIES

IMAGES TELL STORIES

COMICS TELL STORIES

MOVIES TELL STORIES



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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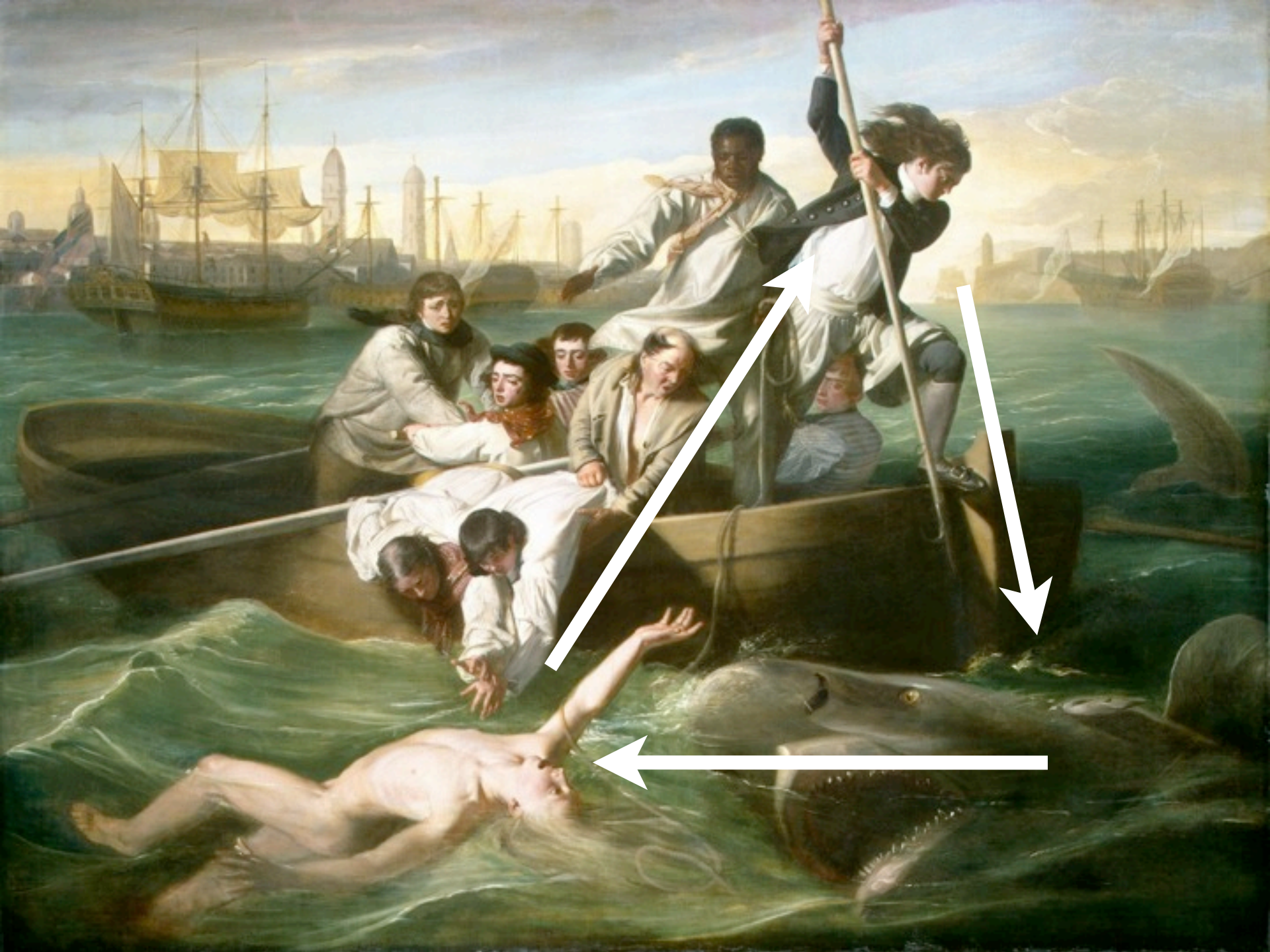
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Nut Graph

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HOW CAN YOU
TELL STORIES WITH
DATA?



Privacy and the internet Lives of others

EVERYONE HAS A SECRET. Facebook and Google face a head-on clash over how and regulates all but in the way they have handled sensitive data

JENNIFER STOCKWELL, Canada's privacy commissioner, is in trouble with Facebook. In August 2009 the social networking site struck a deal, agreeing to change its policies within a year to comply with the country's privacy law. It is now, says Ms Stockwell, the company appears to be treating an important part of that deal, which included giving users a clear and easy-to-understand choice as to whether to disclose data to third parties. "It doesn't seem to me that Facebook is going to be right to opt out of this issue," she says, hinting that, without a change of course, the firm could soon become the subject of another formal investigation by her organisation.

Facebook is not the only internet giant to provoke the ire of data watchdogs. Google endured withering criticism this week following news that it had accessed some personal communications sent over unsecured Wi-Fi data networks in homes and offices in some 30 countries. On May 17th Peter Schaar, Germany's federal commissioner for data protection, called for an independent investigation into Google's behaviour, claiming that it had "simply disregarded 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

tyrants such as Cory Doctorow, a science-fiction author, and Tim Larpent, a politician, have abandoned Facebook. Sites such as Justia.com and Blogger are urging others to do so, reminding May 1st for a mass Facebook "boycott".

There is unlikely to stop the momentum of Facebook, which is poised to claim half a billion members and which drives even more visitors as a whole to its site (see charts). But moves have been made at the company's headquarters in Menlo Park, where bosses are mulling over how to respond. Several senior folk are now hinting that Facebook will soon roll out simpler privacy controls to make it easier to keep more data hidden. MySpace, a rival, is already making its controls simpler 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 that reflected a shift in society towards greater openness and noted that users could still adjust privacy settings. Back again, but increased privacy activists lobbied for it to be reversed.

The switch should not have come as a surprise. Early on, many social networks

Also in this section

- 68 Spring companies
- 88 The recovery of General Motors
- 88 Business crime in China
- 70 Indian retail
- 70 Japan's drug firms are the model
- 74 Brazil's telecoms
- 74 Schumpeter: Overstretched

See July 2011 and August 2011 issues, and economist.com/business/section

responded to tough privacy policies in order to attract and maintain users. But as more join, controls are gradually loosened to encourage more sharing. As people share more, Facebook can increase the value against which it sells advertising. And the more it knows about users' likes and dislikes, the better even targeted ads that generate hundreds of millions of dollars.

Privacy goes further still following a developers' conference last month at which Mark Zuckerberg, Facebook's boss, announced yet another series of policy changes. One that raised eyebrows was an "extended personalisation" feature that lets certain third-party websites access Facebook data when people visit. Critics say that Facebook has made it risky to disable this feature, which may explain why its sudden dislike so much.

European officials are grumbling about Facebook too. This month a group of data-protection experts who advise the European Commission wrote to the social network, calling its default controls the "default settings" "unacceptable". And in the



small support
afterthought
boring?

Published: February 2, 2010

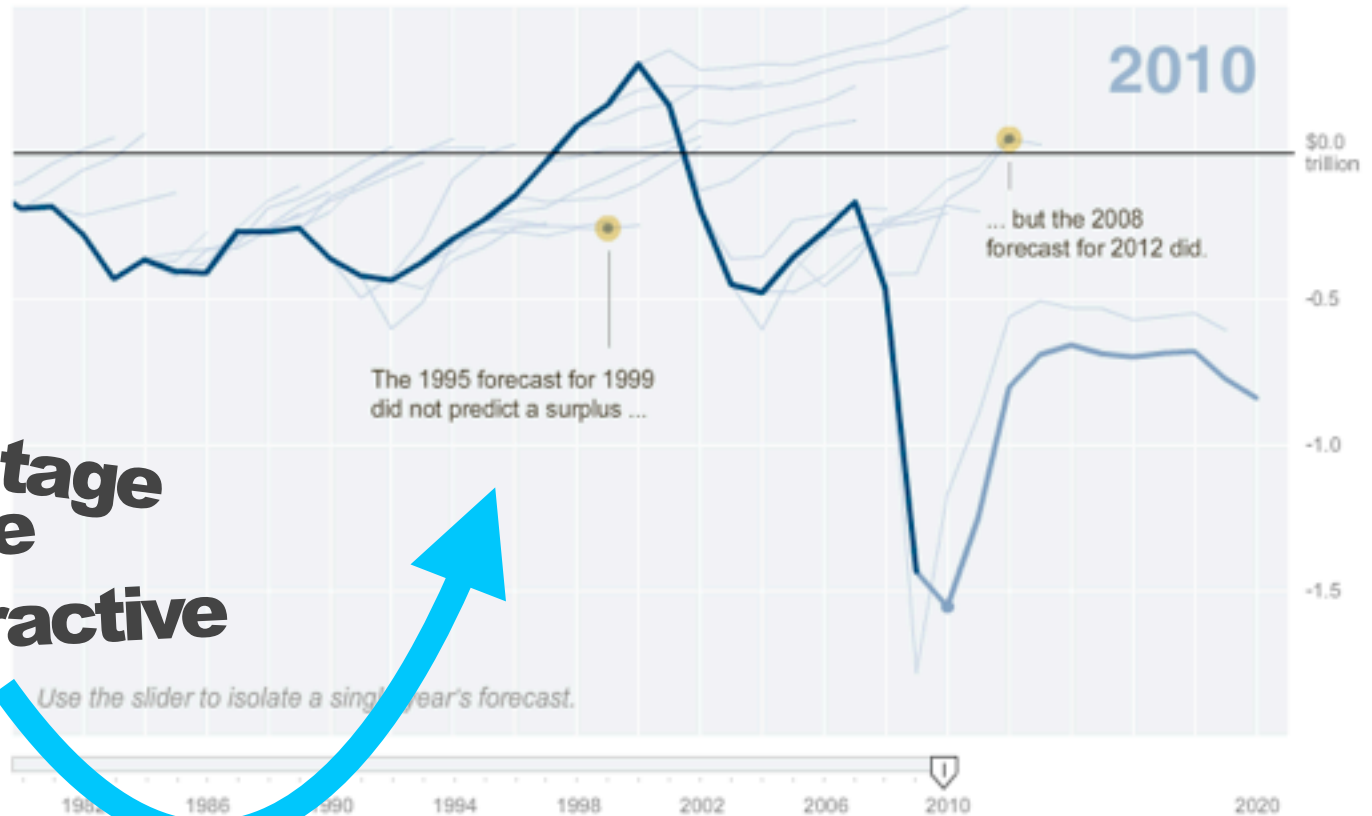
Budget Forecasts, Compared With Reality

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.



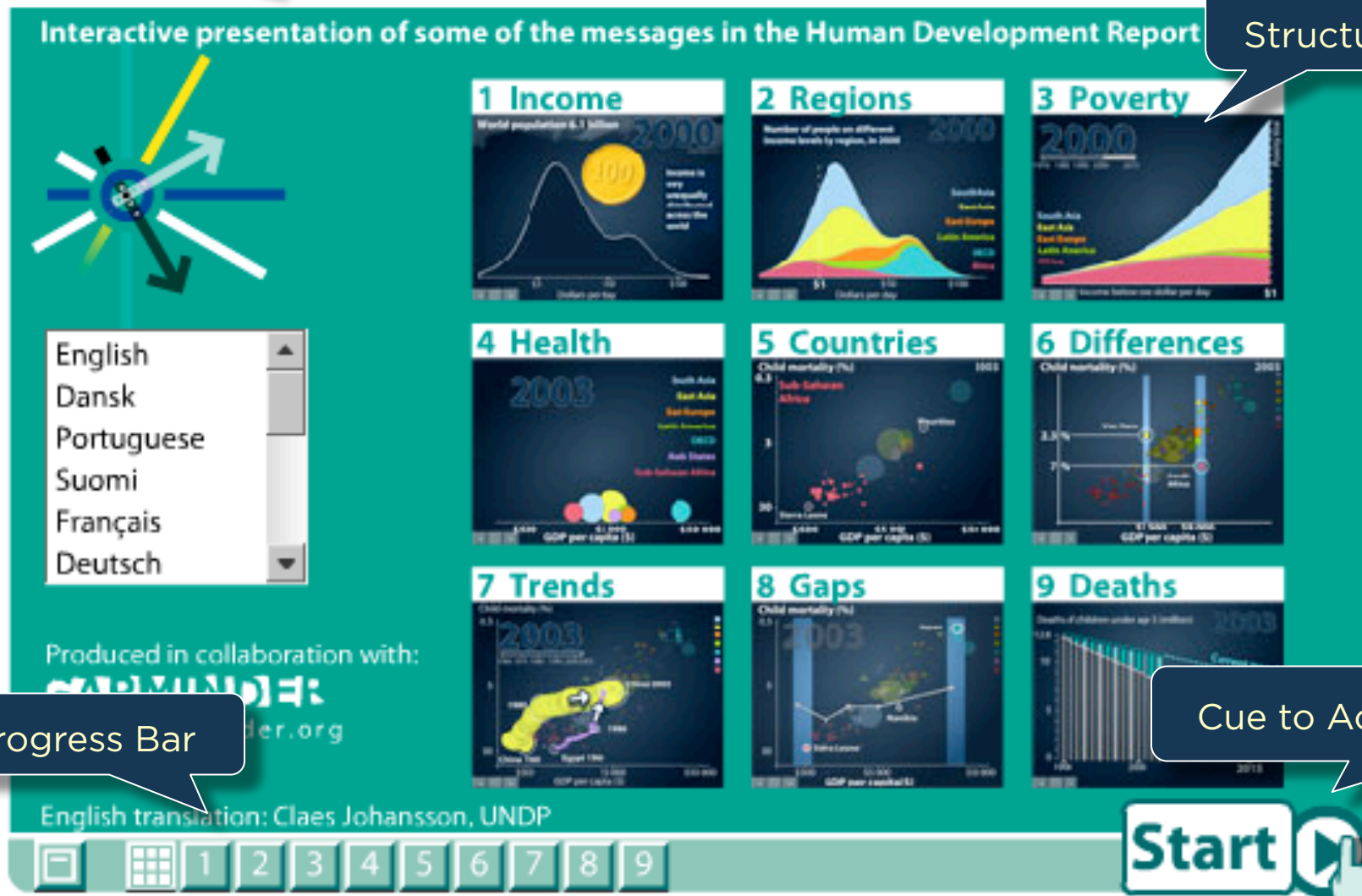
center stage
standalone
interactive
guided

Establishing Shot

Development Trends 2005



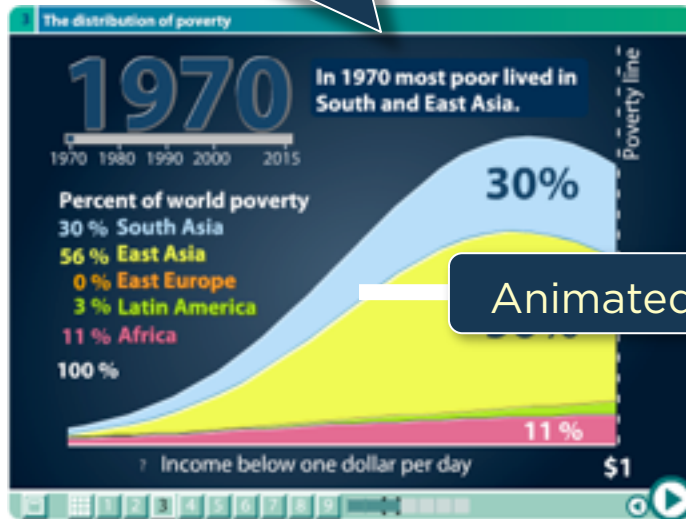
Checklist
Structure



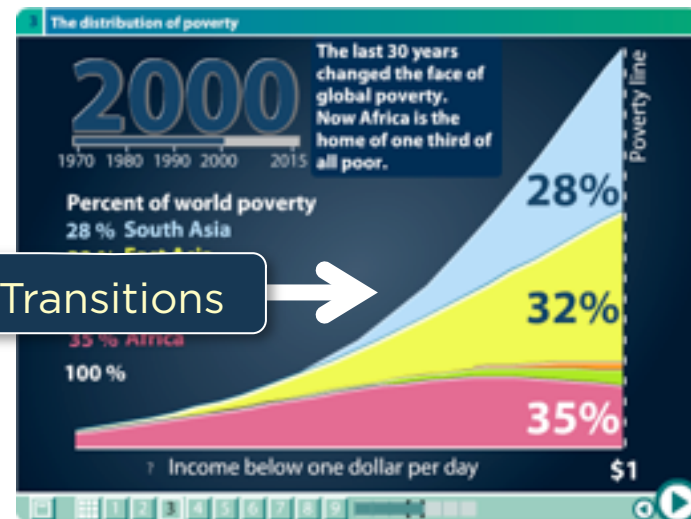
Progress Bar

Cue to Action

Annotations Tell Story



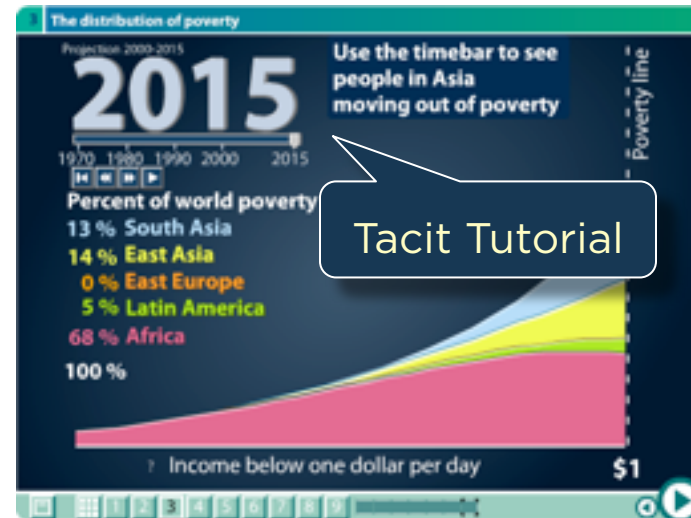
Animated Transitions



Timeline Slider



Tacit Tutorial



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

Consistent
Visual Platform

Introductory Text

any Ridley and Carly Le
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.

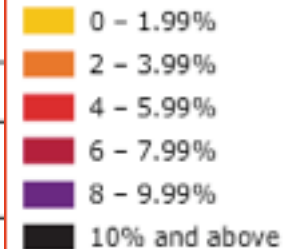
Constituency profile

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

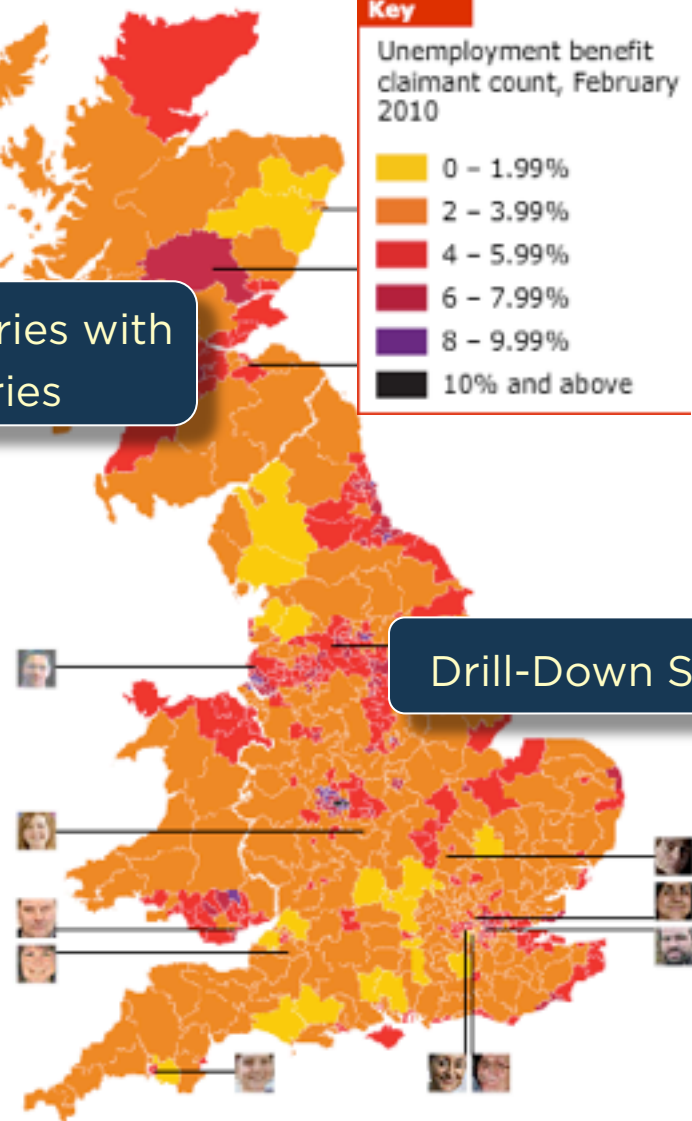
Anecdotal Stories with
Data Stories

Key

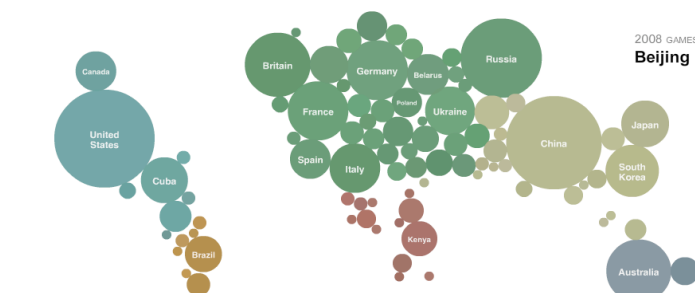
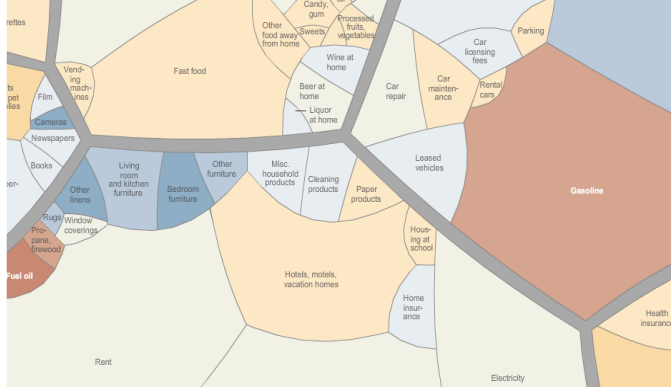
Unemployment benefit
claimant count, February
2010



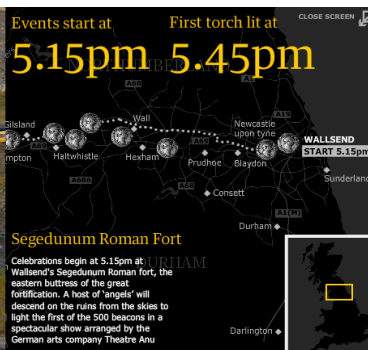
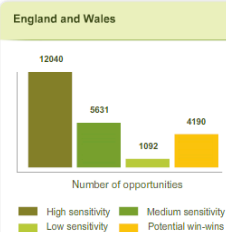
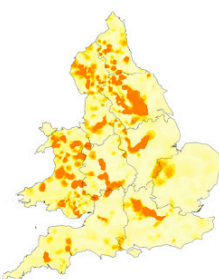
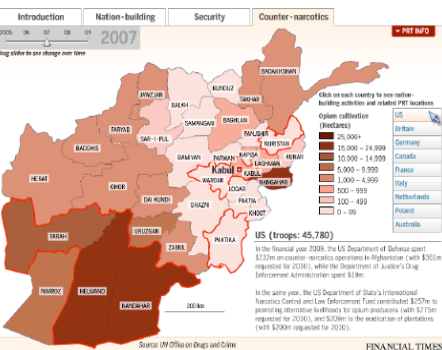
Drill-Down Story



THE NARRATIVE FRAMEWORK



2008 Medal Count



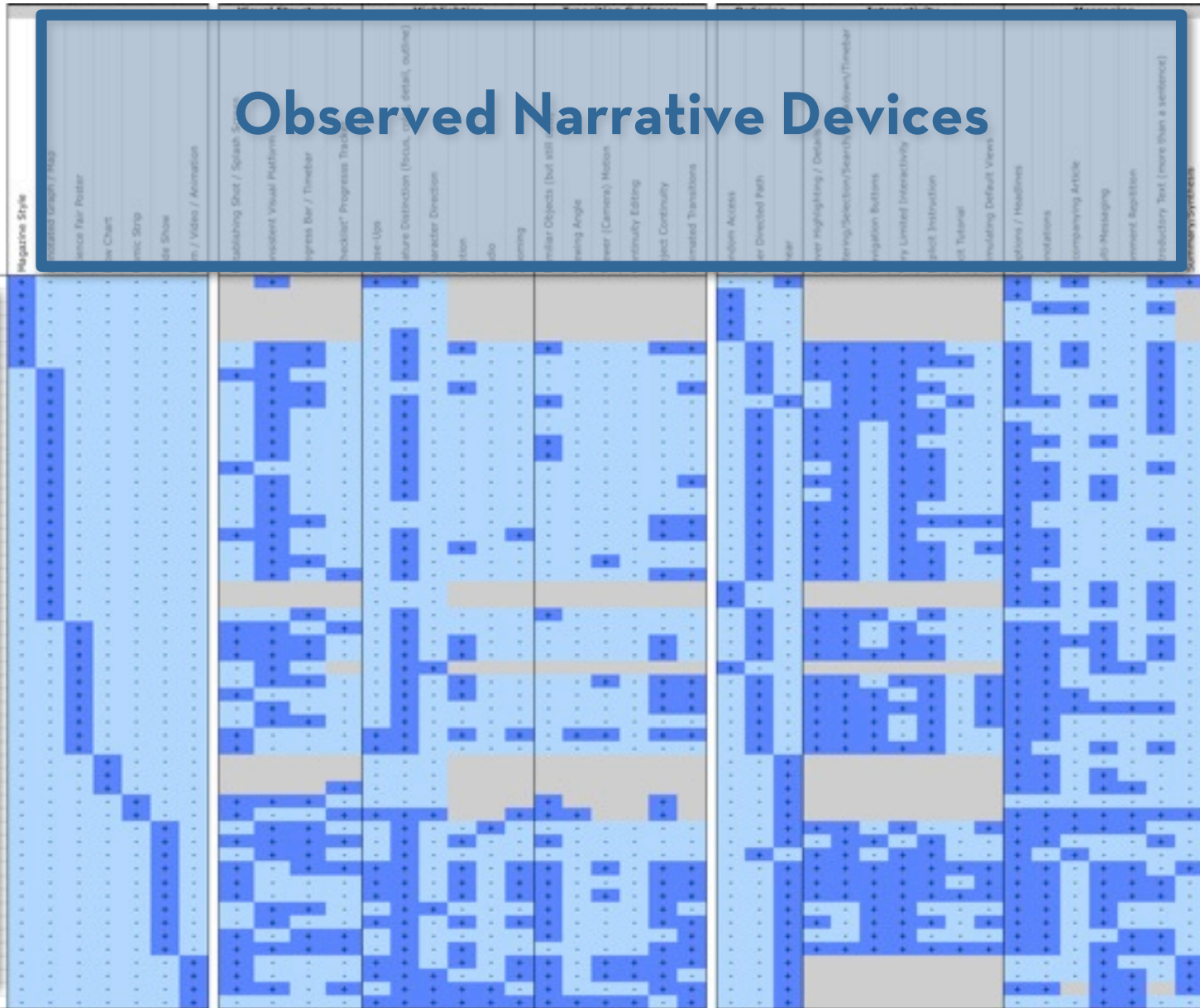
58 CASE STUDIES

70% Journalism
20% Business
10% Research

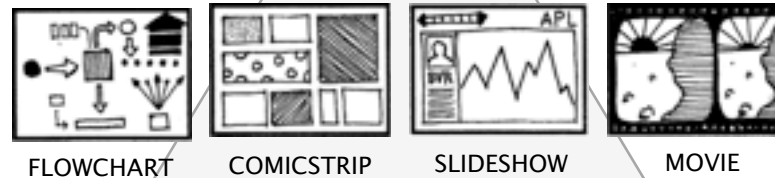
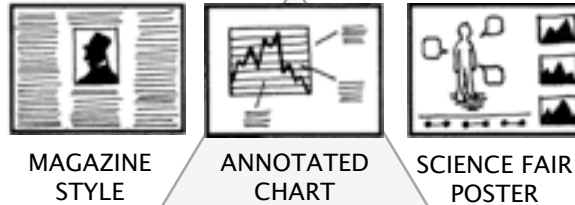
Observed Narrative Devices

Visualization Description

Architecture and Justice (Brooklyn Crime Blocks)
 Journalists abuse their free-mailing privileges before elections
 Football (soccer) drawings
 Pedestrians crossing the street
 The Climate Agenda
 Why Did Your County's Jobs Disappear?
 Acoustics House Price Index
 Bank earnings: How compensation relates to performance
 Deadly offensive: Taliban attacks in Pakistan
 GDP moves by Sector
 UK economic data
 Budget 2010: Reaction from around the UK
 Formula One 2009: driver's rankings
 Lighting up Hadrian's wall
 Mapping hydropower hotspots across the UK
 Moscow metro bombs: interactive map
 The world economy turns
 Medal of Olympic Medalists
 Inflation's Little Parts
 Bonds visualization (interactive)
 The Job and Flow of the Box Office
 The Jobless Rate for the Box Office
 Assessment: Helicopter
 Obama's schedule
 Oscars 2010: the best picture nominees
 The consumer and retail price indices since 2006
 UK's Spending Intentions
 Bonds Visualization (Static Image)
 Comparison of Bear Markets
 How Americans Spend Their Day
 Michelle Obama's Family Tree
 Netflix Rentals
 Vancouver's Olympic Venue
 On the Map: Five Major North Korean Prison Camps
 A Visual Guide to the Financial Crisis
 Economic Meltdown of 2008-2009
 What Did All the Money Go?
 Life cycle of a beetle through a year
 Kid's "Hacking Comics"
 How the Government Dealt with Past Recessions
 Afghanistan: Behind the front line
 Toyota timeline: a company history
 Gap Under Human Development
 Earthquakes: why they happen
 Iran's nuclear programme
 Sharon White's Double McTwist
 Toyota's stick accelerator problem
 Alpine Skiing, From Technical Turns to Tucks and Speed
 Budget Forecasts vs. Reality
 Mad Men
 Defining the Modern
 The story of the
 Virgin America Airplane Safety Video



Visual Design



Duo-
Specific

Captions

Annotations

Attached
Article

Summaries

Interpret

Headlines

Tacit
Tutorial

Selection

Navigation

Details on
Demand

Timelines

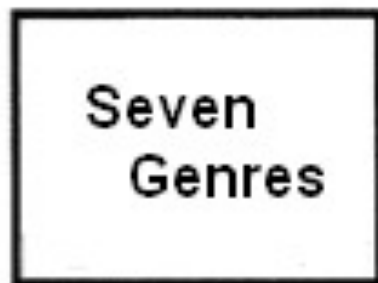
Filtering

Highlighting

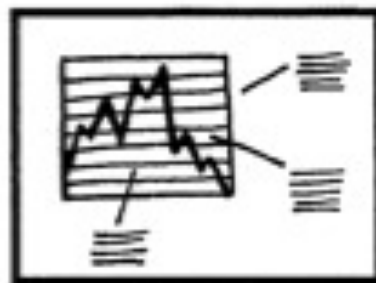
Messaging

Interactivity

MORE



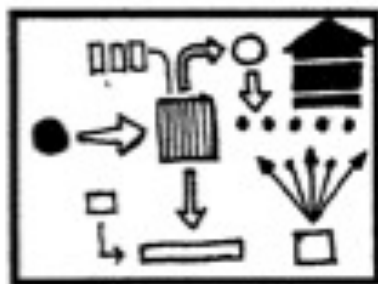
Magazine Style



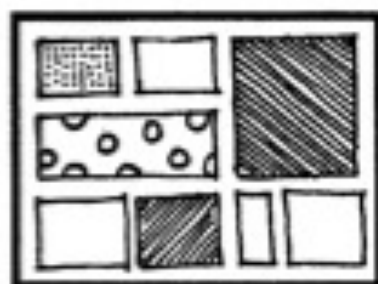
Annotated Chart



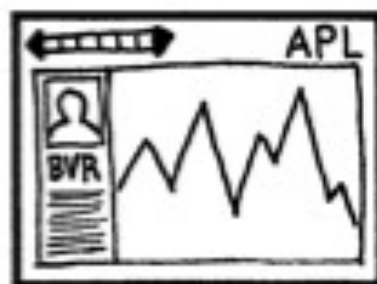
Partitioned Poster



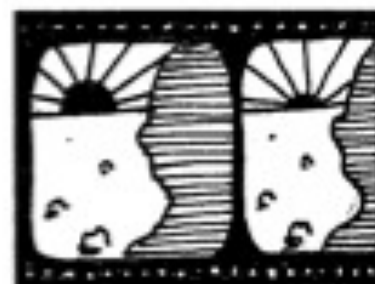
Flow Chart



Comic Strip



Slide Show



Film/Video/Animation

Genres for Narrative Visualization

Genres + Interactivity + Messaging = DESIGN SPACE

STORYTELLING

CLARITY

SPEED

Author Driven

strong ordering
heavy messaging
limited interactivity

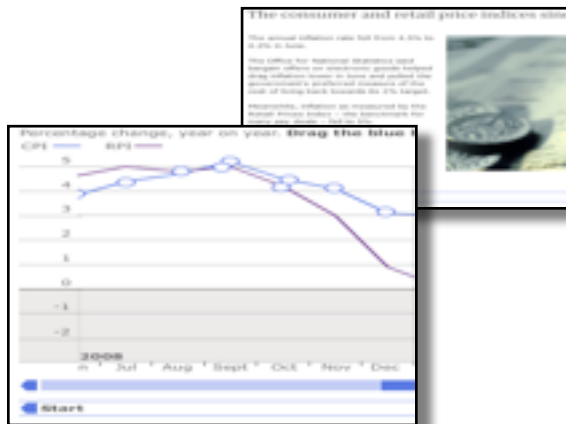
Reader Driven

weak ordering
light messaging
free interactivity

ASK QUESTIONS

EXPLORE

FIND



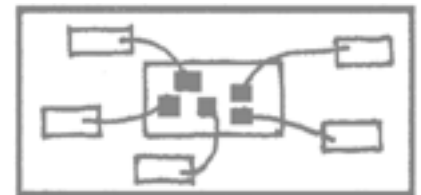
martini
glass

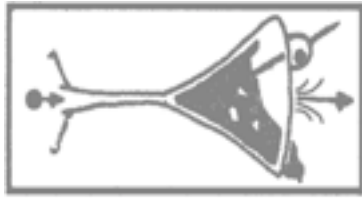


interactive
slideshow

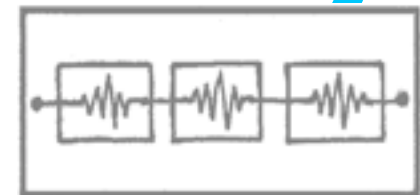
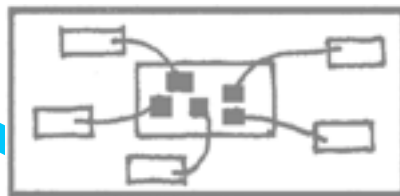
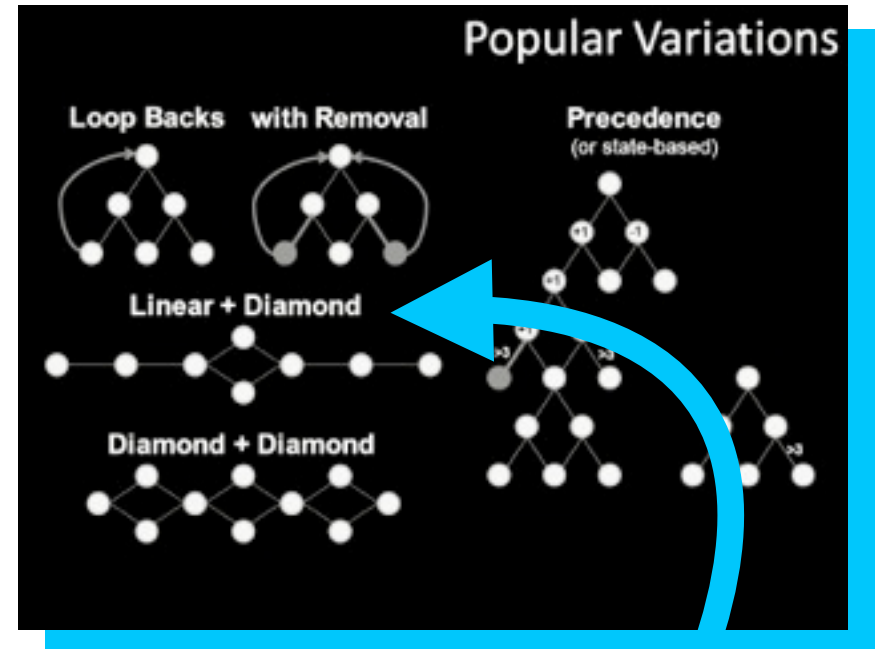
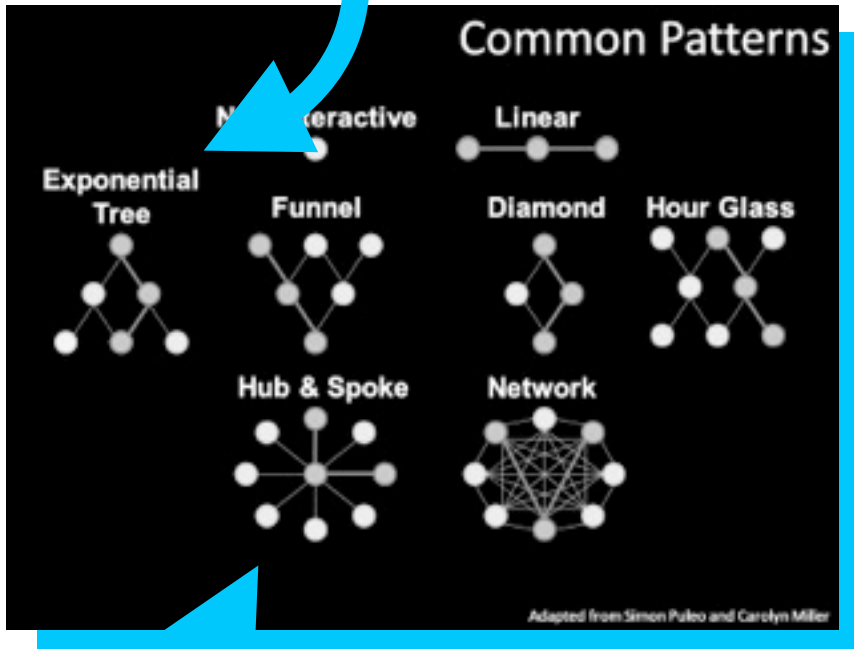


drill-down
story



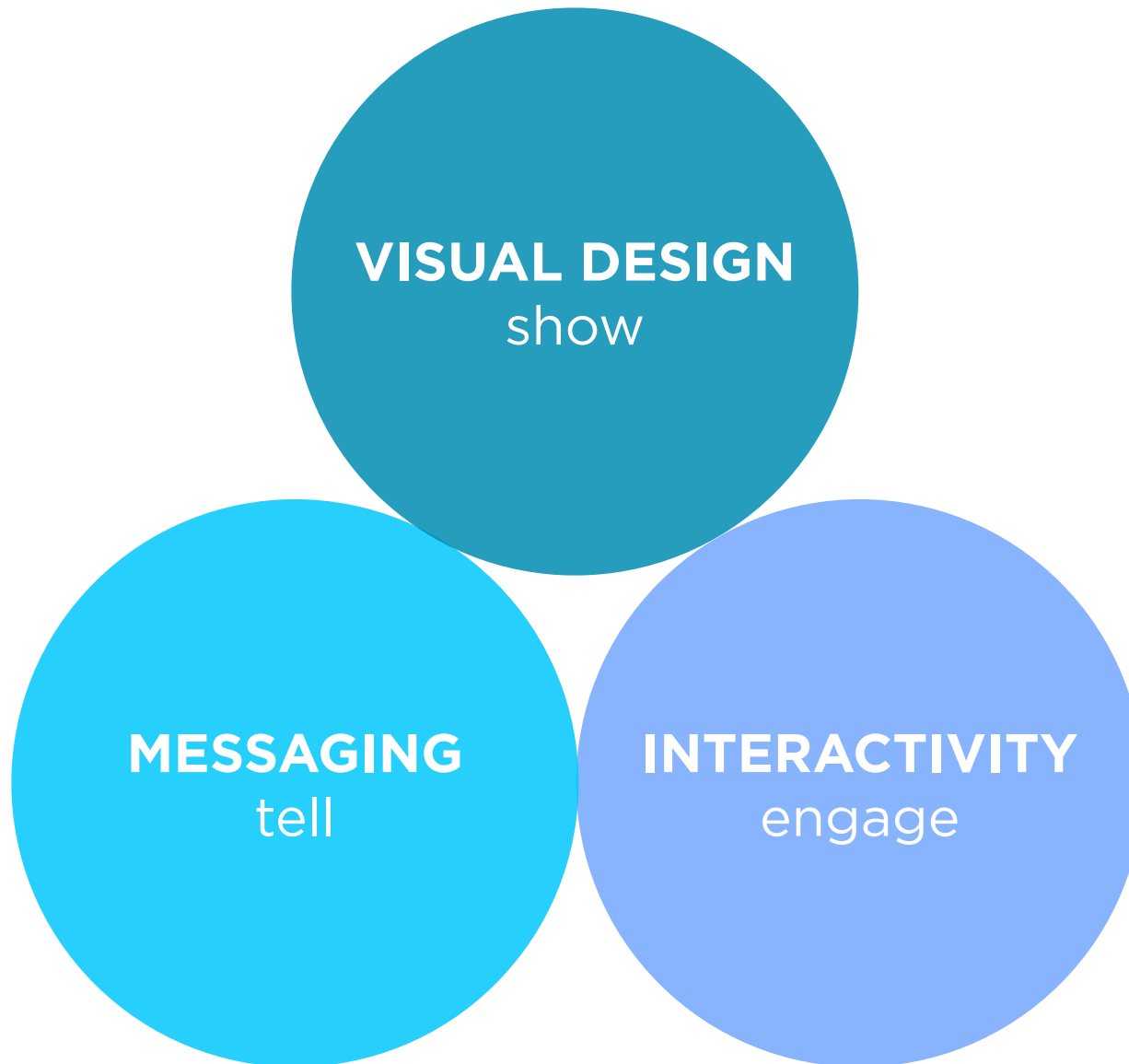


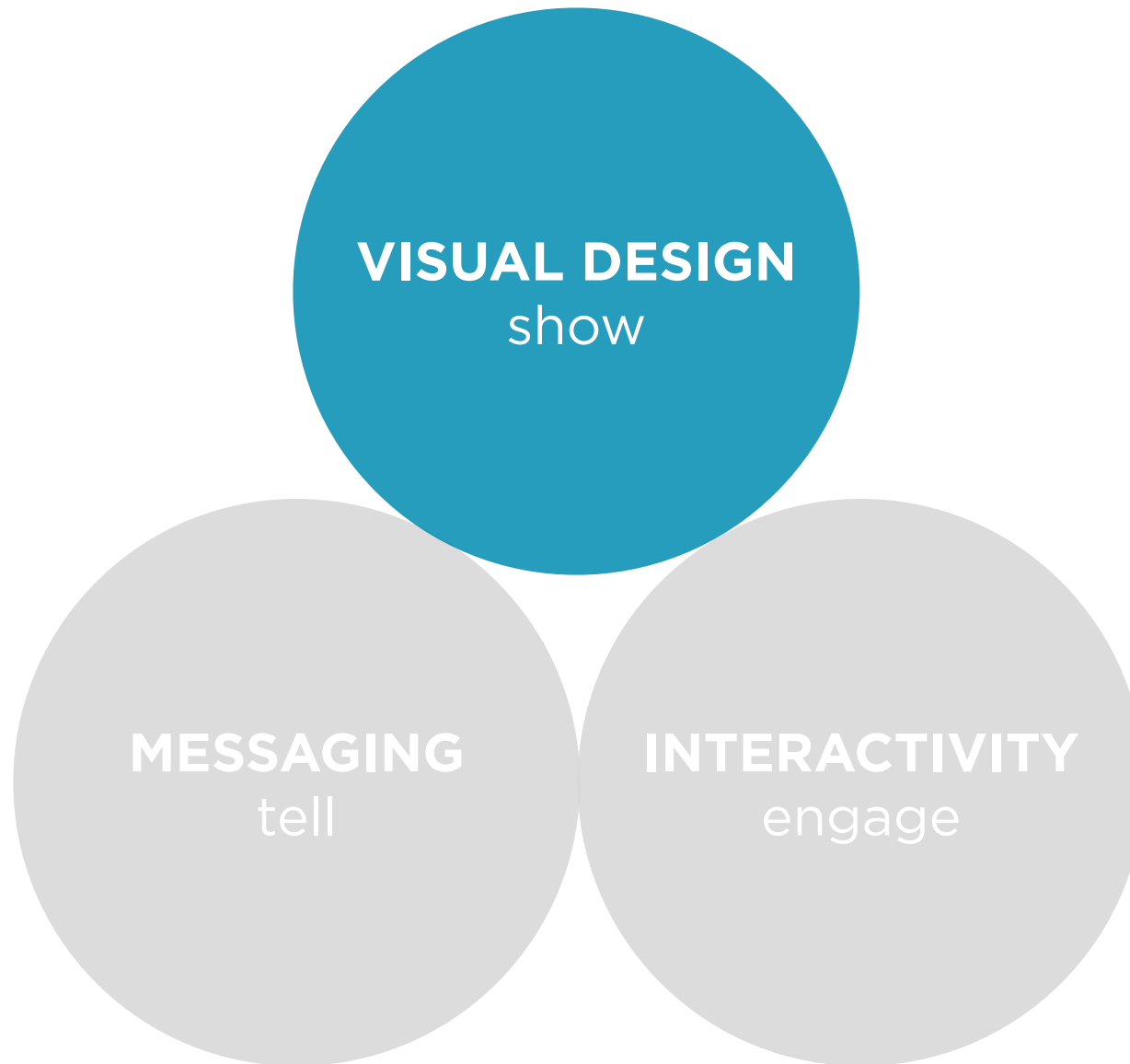
(more patterns)



THE DESIGN CATALOGUE

Guide. Highlight. Interpret.





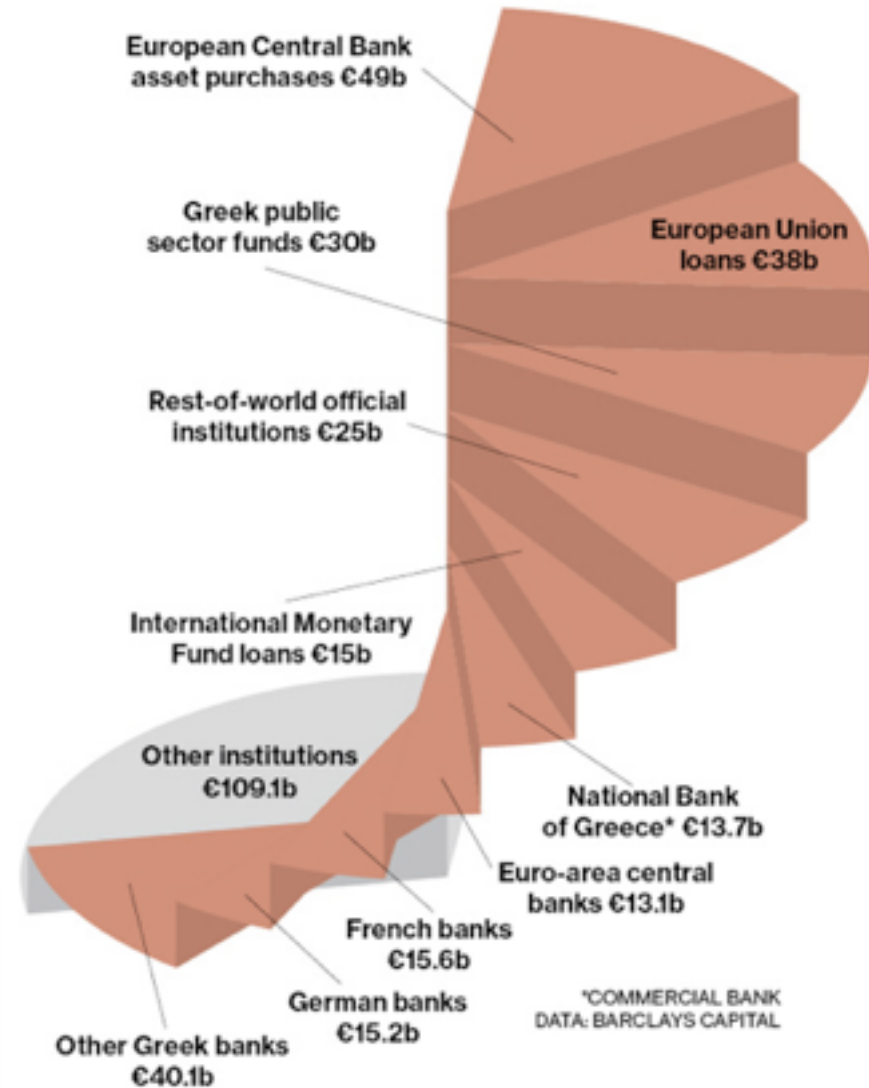


Choose your visualization type carefully. Know your options. Even obscure ones.

“Cool” and “readability” are often at odds. Recognize the trade-off and choose your audience.

Who Owns Greece's Debt?

Taxpayers would suffer from a Greek default since public institutions are the biggest creditors



Representative	District	Fiscal 2010 contract spending
Mike Coffman	Colo. 6	\$3.26 billion
Doug Lamborn	Colo. 5	2.98 billion
Rob Bishop	Utah 1	2.76 billion
Kenny Marchant	Texas 24	2.58 billion
Jeff Duncan	S.C. 3	2.48 billion
Sandy Adams	Fla. 24	2.36 billion
Lamar Smith	Texas 21	1.65 billion
Steve Scalise	La. 1	1.49 billion
Jeff Landry	La. 3	1.47 billion
Roscoe Bartlett	Md. 6	1.44 billion
John Carler	Texas 31	1.42 billion

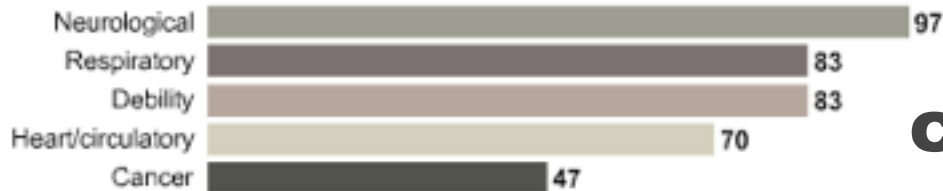
dirty

Avoid “chart junk” (Tufte).
Extra marks
distract from the
data.

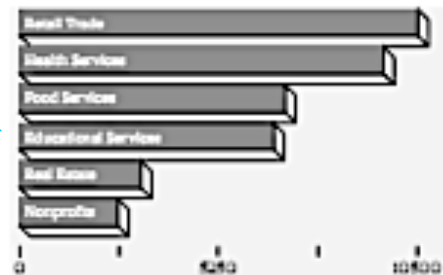
better

Rank	Country	Alcohol consumption	Total quarts
1	Republic of Moldova	4.5	14.6 19.3'
2	Czech Republic	3.8	13.6 17.4
3	Hungary	3.2	14.0 17.2
4	Russian Federation	7.3	9.4 16.7
5	Ukraine	5.5	11.0 16.5
6	Estonia	9.7	6.7 16.5'
7	Andorra	3.3	13.0 16.4'
8	Romania	4.4	11.3 16.2
9	Slovenia	7.1	14.6 16.1'
10	Belarus	4.5	11.7 16.0
11	Croatia	2.0	13.9 16.0'
12	Lithuania	4.8	11.1 15.9
13	South Korea	10.1	5.5 15.6
17	U.K.	2.5	11.3 14.1
56	U.S.	2.3	7.2 10.0

clean



sexy?



But...

chart junk may reflect cool
design choices

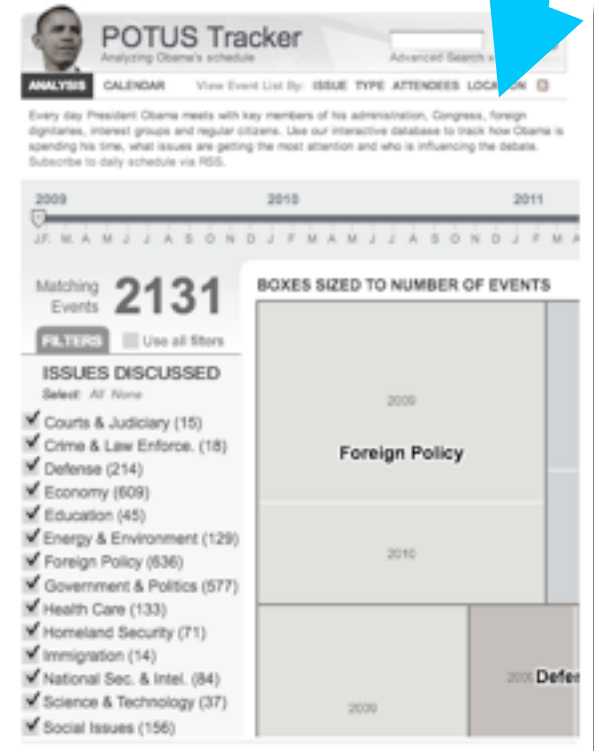
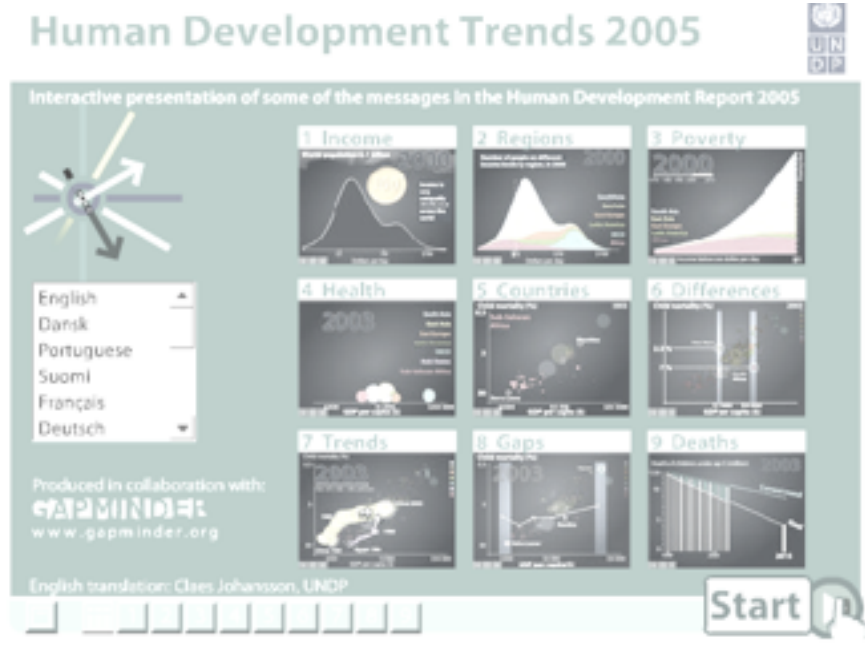
Businessweek...

does great with labeling
only as much as needed

Make it clear
where to
start.
Don't let
readers
defect.



where?



Taking the Corners

A look at the technique of American speedskater Shane Davis, who won gold in the 1,000 meters and silver in the 1,500.



Taking the Corners

A look at the technique of American speedskater Shane Davis, who won gold in the 1,000 meters and silver in the 1,500.

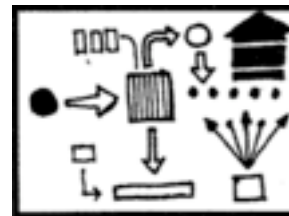


Taking the Corners

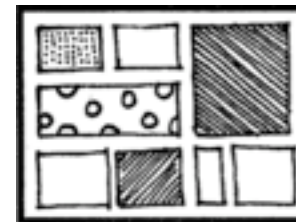
A look at the technique of American speedskater Shane Davis, who won gold in the 1,000 meters and silver in the 1,500.



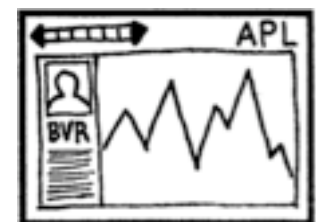
The more linear, the more like a story.
Stories have a beginning, middle, and end.



FLOWCHART



COMICSTRIP



SLIDESHOW

Consistent
visual
frameworks.
Keep things
tidy.

Dodd-Frank One Year Later: The Key Players

When Dodd-Frank was signed into law a year ago, the lobbying in Congress moved to the regulatory agencies. Now financial firms are arguing with regulators and each other over the language of hundreds of rules that will determine how much Dodd-Frank will change the system.

[Explore the key players >](#)

Photos from Bloomberg, U.S. Chamber of Commerce, U.S. Securities and Exchange Commission

Source: Bloomberg reporting



Bloomberg
GOVERNMENT

The Social Network



Black Swan



The King's Speech



The Fighter



127 Hours



The Kids Are All Right



Guardian Review



Observer Review



Interview



Interview



Trailer



More

8 nominations

Many people have the Golden Globes winner down as the film to rain on the king's parade. Its slick script and well-pitched performances impressed critics and picking a film about the internet may help Academy members feel like they have their fingers on the pulse

IMAGES: GETTY IMAGES, ALLSTAR/COLUMBIA PICTURES



Toy Story 3



The Social Network



True Grit



Inception

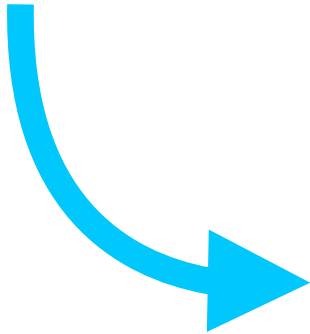


Winter's Bone

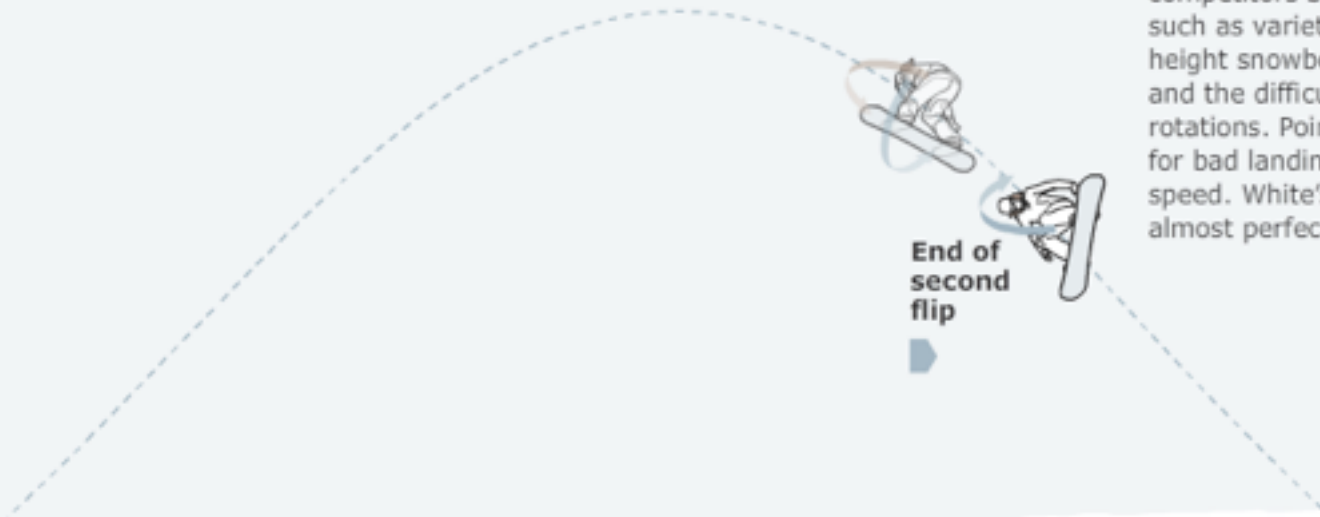
CONTINUED...

Consistent visual frameworks.

Keep things tidy.

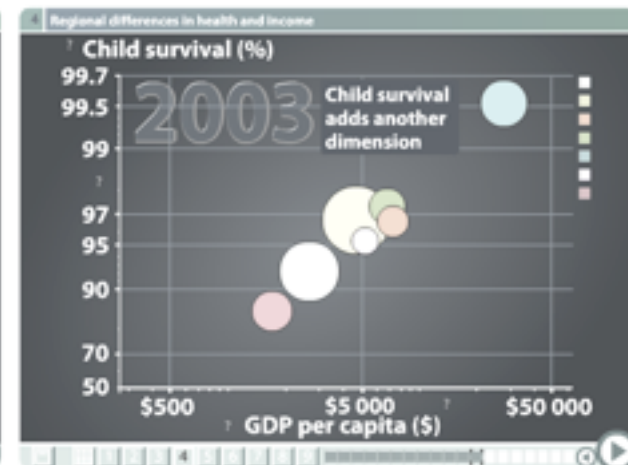
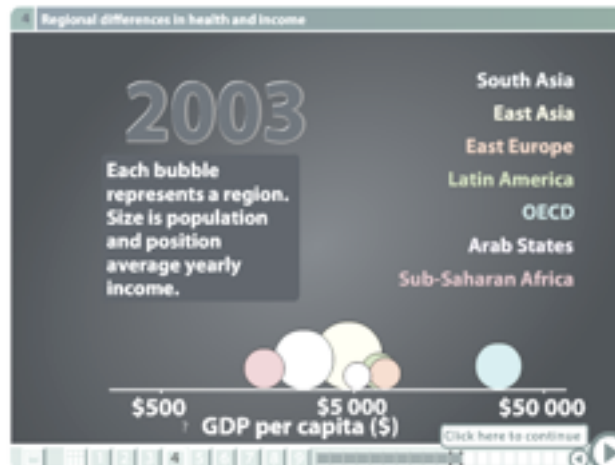
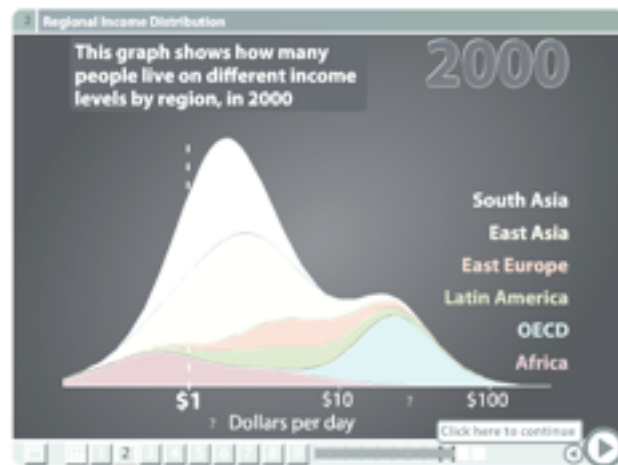
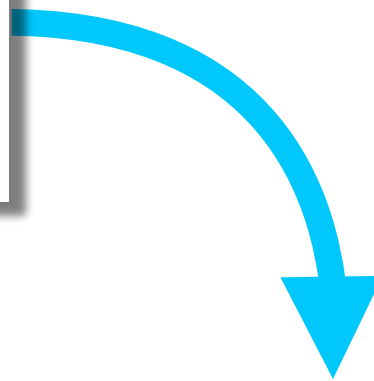


The jump



Five judges award points to competitors based on factors such as variety of tricks, the height snowboarders reach and the difficulty of tricks and rotations. Points are deducted for bad landings and a lack of speed. White's jump was almost perfect

Use staging and animation
for complicated transitions.
Stage big transitions to
avoid confusing readers



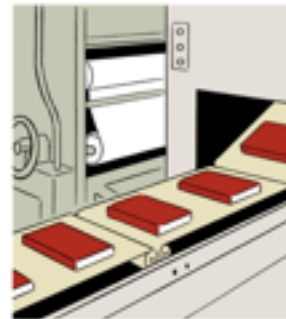
Transitions Guidance

Viewing Angle
Viewer (Camera) Motion
Continuity Editing
Object Continuity
Familiar Objects

PRICE \$4.50

THE NEW YORKER

FEB. 25, 2008



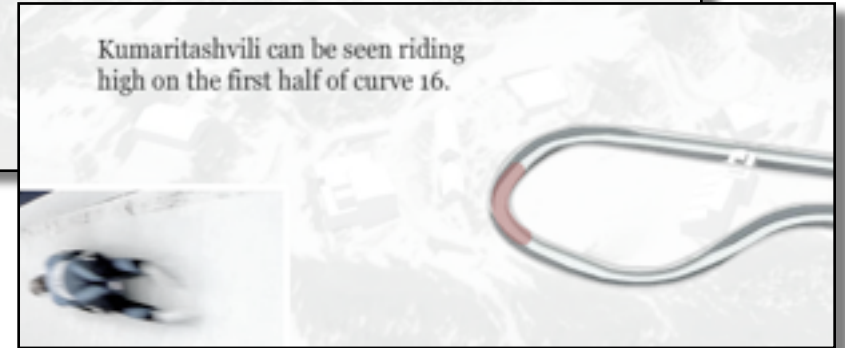
REARVIEW

Use
establishing
shots.

Situate the
viewer before
diving in.



Use establishing shots.
Situates the viewer before diving in.



good

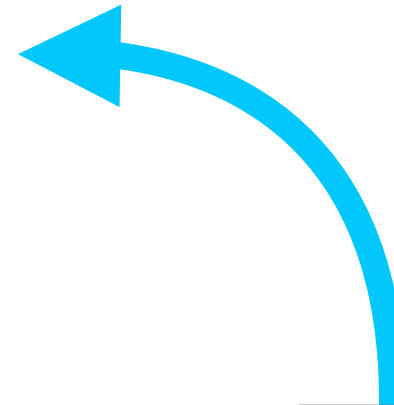


bad



Highlighting Techniques

Character Direction
Feature Distinction
Close-Ups
Zooming
Framing
Motion
Audio



Make it clear what to look at and when.
Guide readers through the story or they'll get lost.

PRICE \$3.50

JULY 30, 2001

THE NEW YORKER

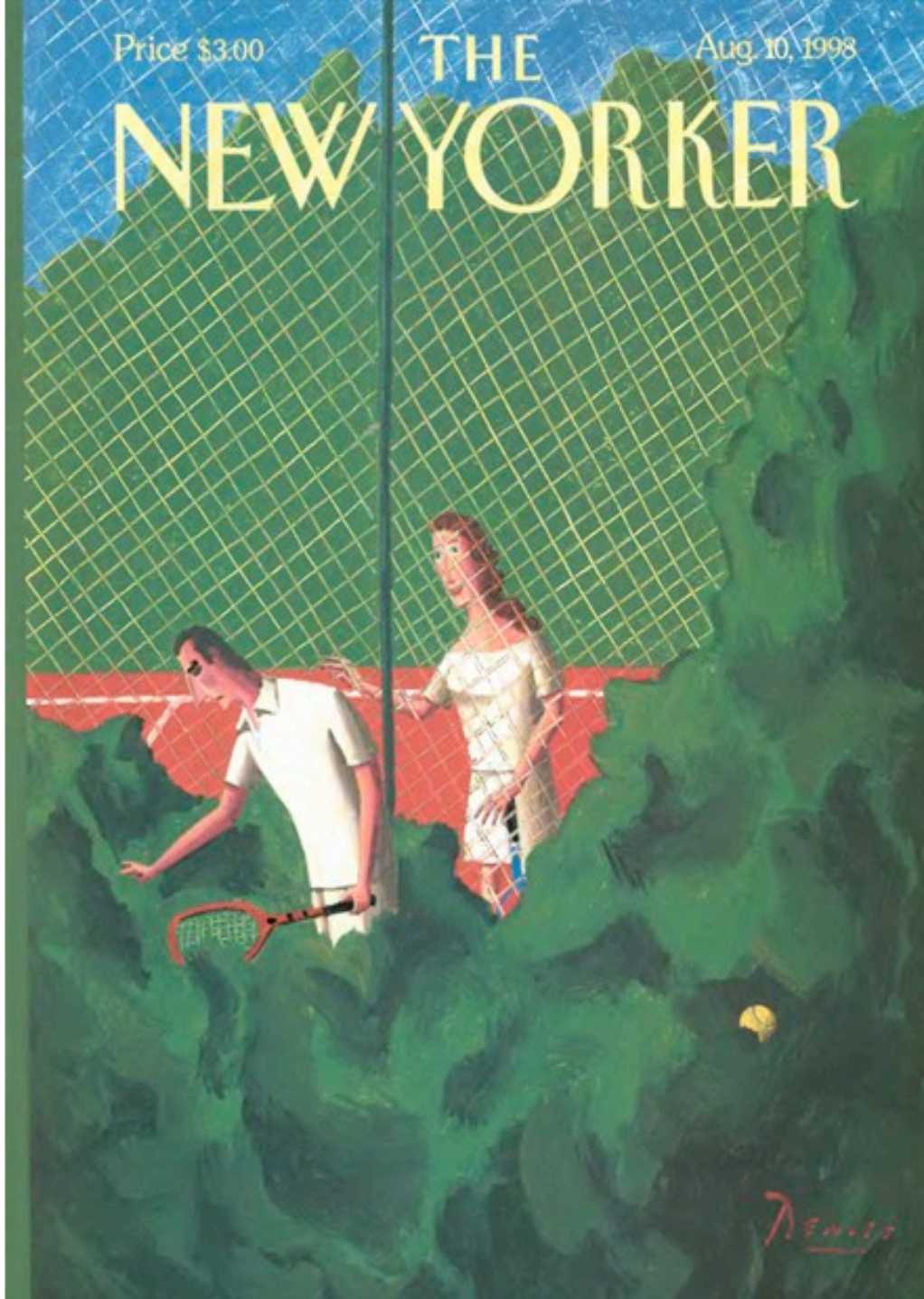


alvise

Price \$3.00

Aug. 10, 1998

THE NEW YORKER



755

Grab attention with image and position



Line chart 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

Ma
on

According to a book he began steroid season, league later had runs, so career p

Reduced visual priority

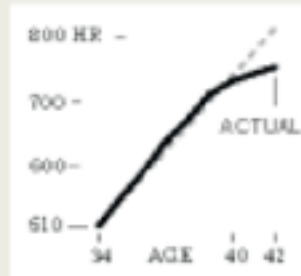
Homer Pace After Age 34

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

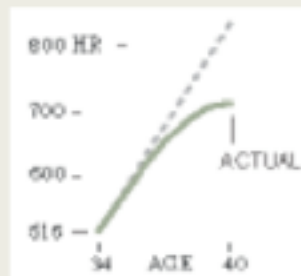
Aaron

Actual homers slightly outpace projected homers for five seasons.



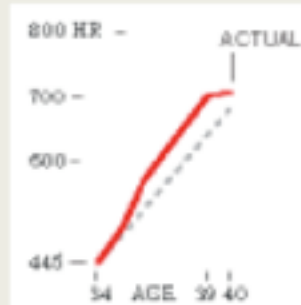
Ruth

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



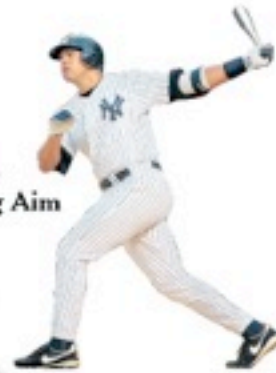
Bonds

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

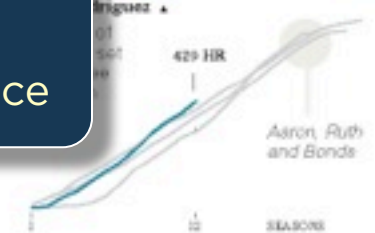


Note: Ages as of July 1 of each season.

Others Taking Aim

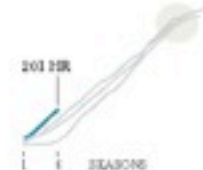


nce



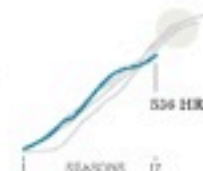
Albert Pujols

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.



(1257th).

Alex Rodriguez
429



Albert Pujols
201



Youngest to reach 400 homers.

Second most ever in first five seasons.

A credit to and Joe Ward/The New York Times

Beginning

Steroids or Not, the Pursuit Is On

Barry Bonds is 146 runs at the career home run record. He needs only 146 more to tie Babe Ruth and 43 to equal Hank Aaron.

Hank Aaron
755 homers
23 seasons

Babe Ruth
714 homers
22 seasons

Barry Bonds
708 homers
20 seasons

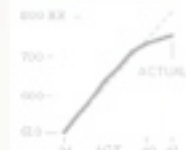
Bonds takes lead
Home runs
after 18 seasons
Bonds 567
Aaron 554
Ruth 514

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

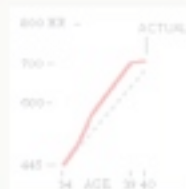
Aaron
Actual homers slightly outpace projected homers for five seasons



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



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.

Middle

Others Taking Aim

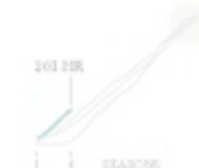
Alex Rodriguez

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 he would be the one to catch Ruth and Aaron until injuries limited him.



End

Differing Paths to the Top of the Charts

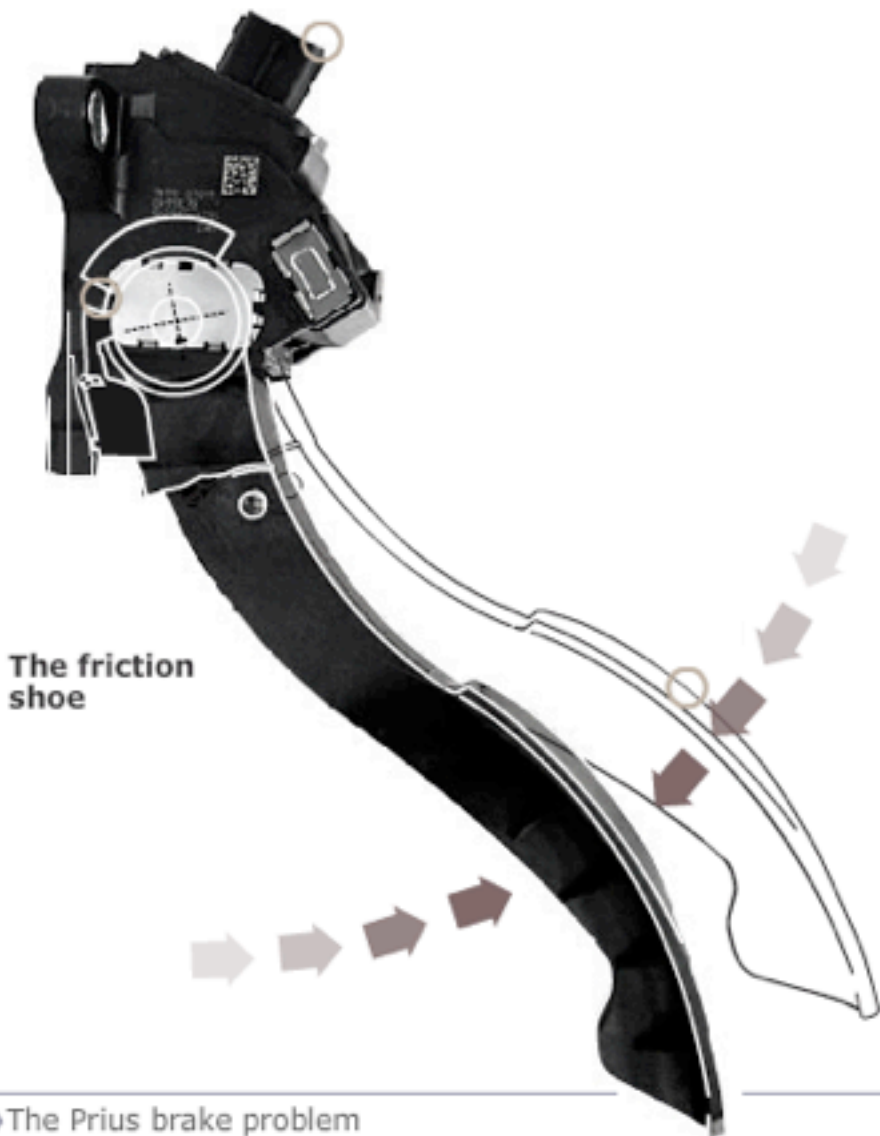
The top seven players on the career home run list, along with a look at Griffey (12th), Rodriguez (37th) and Pujols (tied 25th).



Epilogue

Toyota accelerator

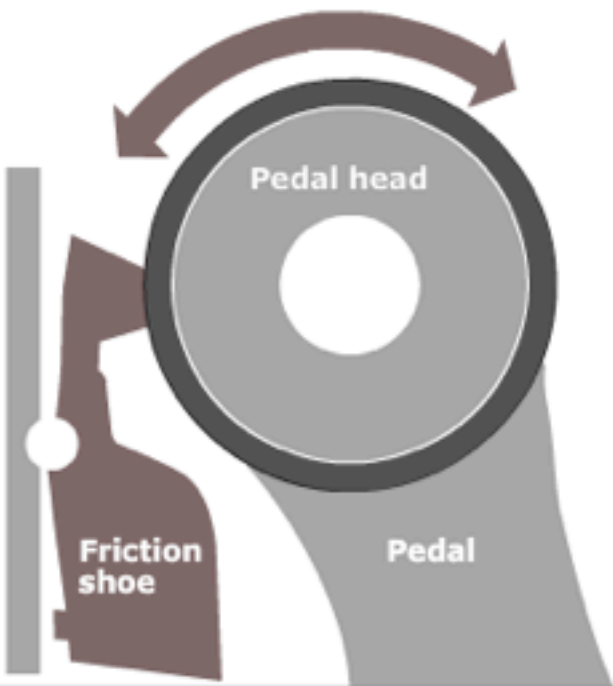
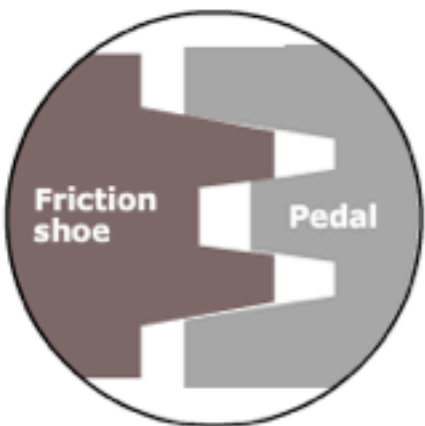
Roll over the circles



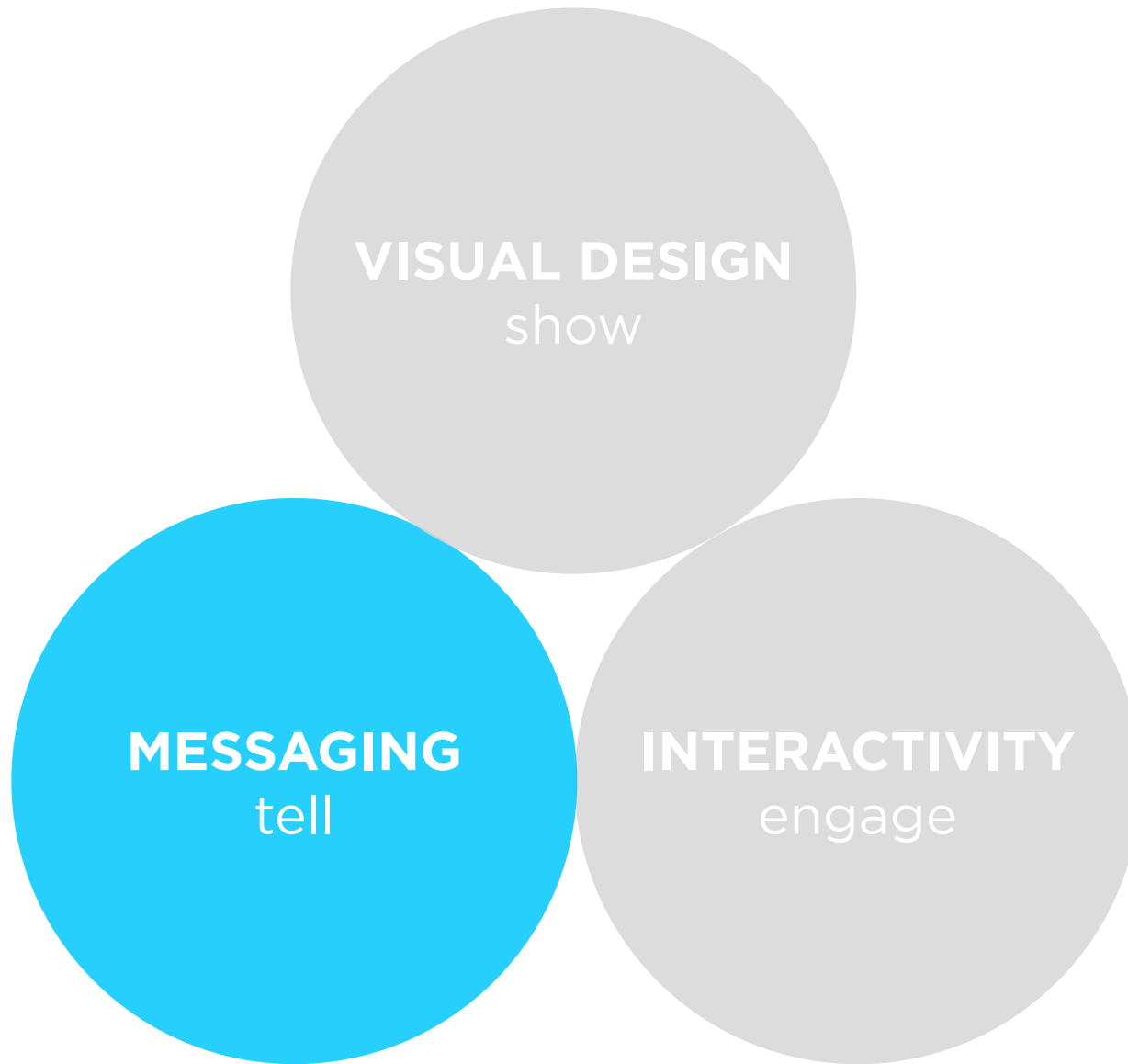
▶ The Prius brake problem

The problem

Grooves on the pedal head mesh with grooves on the shoe creating friction. Occasionally this has been so great that the pedal has jammed against the shoe



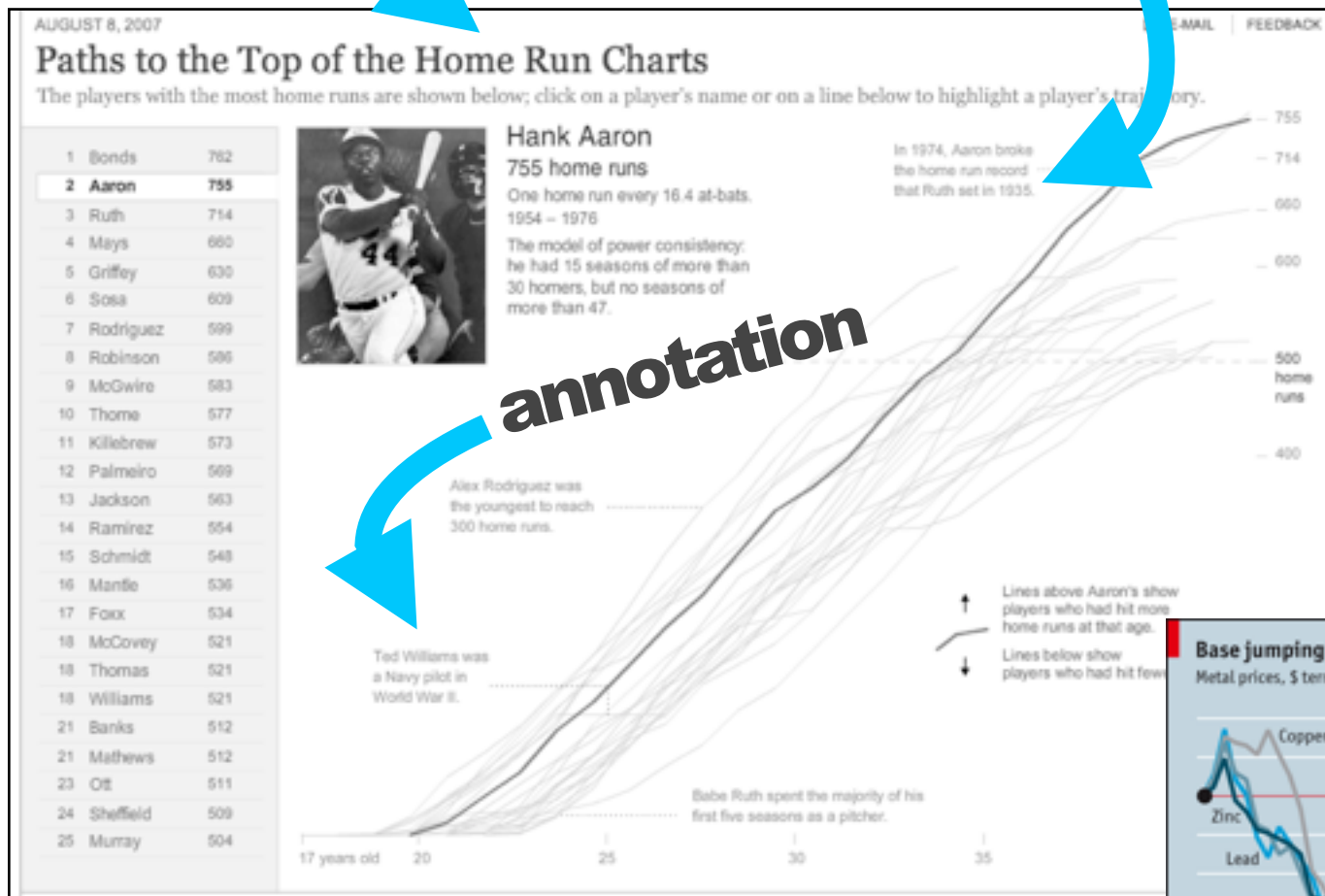
▶ Next



headline

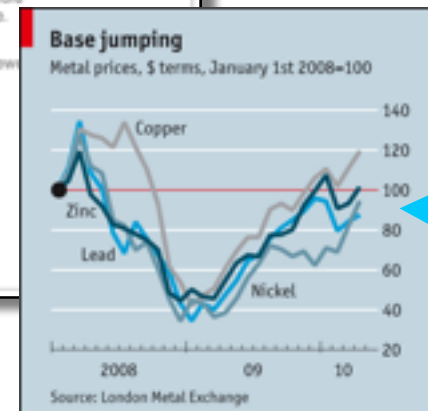
caption

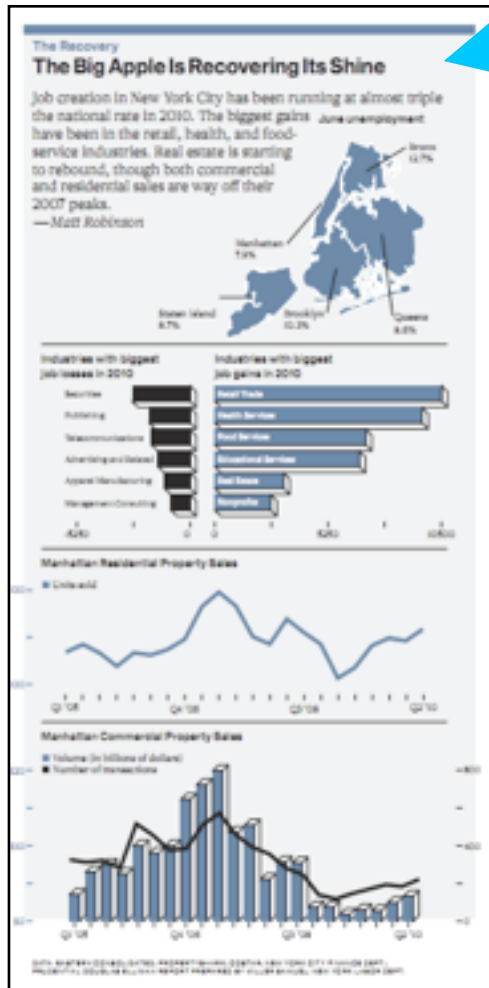
Use headlines,
captions, &
annotations.
Quickly draw
attention to
what's
important.



annotation

???





June 20, 2011

isolated

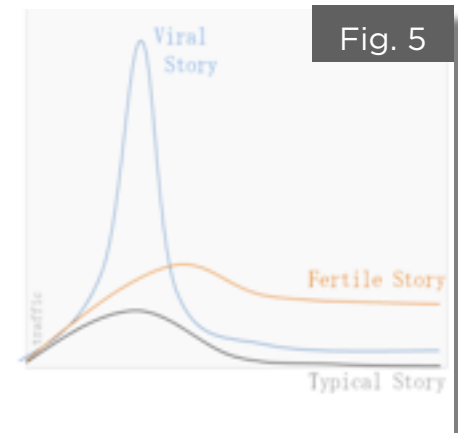
Weave text into the graphic—not just at the beginning.

Text and graphics work better together than apart.

Connect the text to the relevant graphics.

See Fig. 5

quite significantly more work than traditional stories. To make this work economical, visualizations lead to stories that are either *persistent* or *viral* in order to generate traffic. **Persistent stories** cover thematic themes that maintain relevance over time (crisis, food economics, the housing market). Visualizations to persistent themes “fatten and elongate” their visualizations (which are already fatter and longer stories). During this slow-burn, these visualizations are followed by hundreds of stories over several months and they evolve. **Viral stories** achieve heavy traffic in punctuated spikes of popularity. These stories tend to focus on celebrity, personalities, or sensational news. To get the buck, produce visualizations for editorial content that is *persistent* or *viral*.



The Supreme Court gets the Wal-Mart ruling right.

Everything about Wal-Mart Stores Inc. (WMT) is big. Total sales, at \$422 billion last year, exceeded the gross domestic product of all but 18 countries. Its 4,200 U.S. stores employ more than 1.4 million people, more than any other U.S. company.

So the verdict handed down yesterday by the U.S. Supreme Court in *Wal-Mart v. Dukes* was suitably outsized; it decided the largest workplace discrimination case in history. The decision, which was unanimous in one part, and split along the familiar 5-4 ideological lines in another, was the correct one.

The lawsuit was brought on behalf of every woman who worked for Wal-Mart since late December 1998, more than 1.5 million in all. The Supreme Court, which hadn't reviewed the standards for class-action suits in 12 years, told the women they didn't have enough in common to sue the company as a monolithic class.

The female plaintiffs claimed that they had been illegally denied pay and promotions despite a company policy against sex discrimination. The suit relied largely on statistics, which seemed damning enough.

Women filed 70 percent of Wal-Mart's hourly jobs, yet made up only 33 percent of management employees. Women were paid less than men in every region, even when they had higher performance ratings and seniority.

The plaintiffs bolstered their case with affidavits detailing the experiences of 120 individuals. One female worker said

she was told to "dell up" if she wanted a promotion.

Wal-Mart devastatingly turned the numbers against the plaintiffs. One brief filed on behalf of the women cited Census Bureau figures showing that U.S. median earnings of women in 2009 were 77 percent of men's earnings. The company pointed out that women at Wal-Mart earned between 85 percent and 95 percent of what male colleagues earned. They actually did better at Wal-Mart than in the country at large.

As for the affidavits, the company said they represented just one-thousandth of one percent of women employed at the retailer since December 1998.

As Justice Antonia Scalia wrote for the majority, "Without some glue holding together the alleged reasons" for Wal-Mart's pay and promotion decisions, it was impossible to say that all of the class members suffered the same injury at different stores run by different managers across the nation. Wal-Mart allows local managers wide latitude in wages and promotions.

The plaintiffs can still bring lawsuits individually, and many certainly will. Some may even band together in smaller classes — if they worked at the same store, for example, and believe they experienced systemic discrimination from the same managers.

In the end, what the women were really trying to prove is that Wal-Mart has a corporate culture that favors men. Some of the briefs filed with the court claimed that promotions were characterized as a "tap on the shoulder" with local managers having great discretion in deciding whose shoulder to tap. Vacancies were not regularly

posted. Employees were discouraged from discussing their compensation, presumably to prevent comparisons.

As Justice Ruth Bader Ginsburg wrote in a partial dissent, such behavior could be a cover for bias against women. It will be up to other courts to make sure Wal-Mart doesn't use its decentralized management to escape legal responsibility. But those cases should be dealt with on their individual merits — and unique facts.

This opinion is likely to make litigation harder for other employment class actions that bind together disparate litigants in a single class. But a class of 1.5 million employees faces an appropriately high hurdle. This class didn't clear it.

So the verdict handed down yesterday by the U.S. Supreme Court in *Wal-Mart v. Dukes* was suitably outsized; it decided the largest workplace discrimination case in history. The decision, which was unanimous in one part, and split along the familiar 5-4 ideological lines in another, was the correct one.

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The female plaintiffs claimed that they had been illegally denied pay and promotions despite a company policy against sex discrimination. The suit relied largely on statistics, which seemed damning enough. And this is the end of my first graphic for Bloomberg.

1.5 million women sued Wal-Mart for discriminatory pay & promotion practices, using mostly statistics to make their case.

Women filed 70% of hourly jobs...

...but only 33% of management.



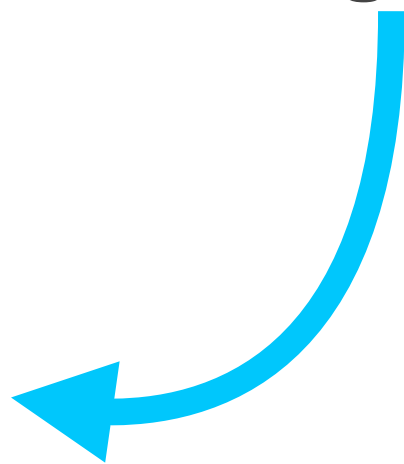
Women were paid less than men in every region, even when they had higher ratings and seniority.

But Wal-Mart's numbers showed their women fared better than elsewhere in the country.



OurView The Supreme Court was right.

integrated



CONTINUED...

Weave text into the graphic—not just at the beginning.
Text and graphics work better together than apart.

Word-Specific

Pictures illustrate the words

Picture-Specific

Words accentuate aspects of the scene

Duo-Specific

Words and pictures send the same message

Intersecting

Words and pictures contribute information independently

Interdependent

Word and pictures combine to convey an idea neither conveys alone

Parallel

Words and pictures seem to be independent.

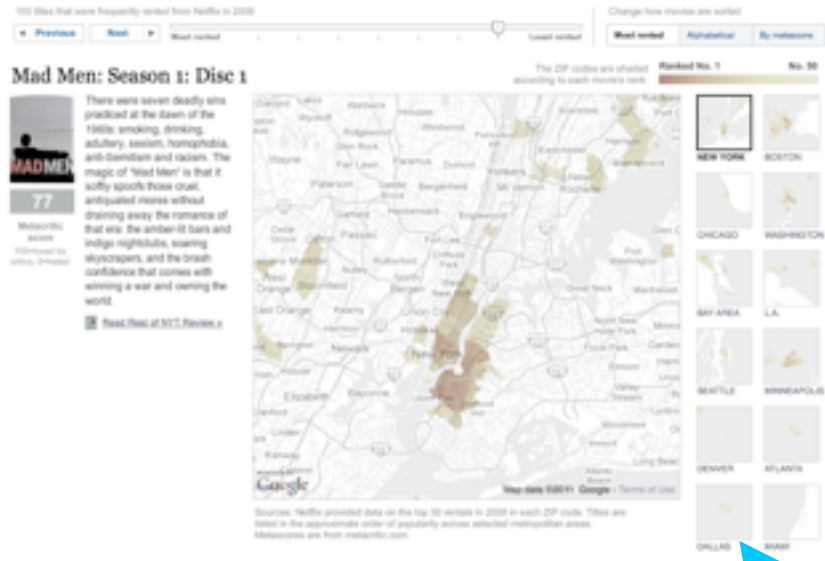
Montage

Words and pictures combine pictorially.



A Peek Into Netflix Queues

Examine Netflix rental patterns, neighborhood by neighborhood, in a dozen cities. Some titles with distinct patterns are *Mad Men*, *Obsessed* and *Last Chance Harvey*. [Comments \(136\)](#)



Start with an editorially interesting view.

Default views can be boring. Curate the experience from the beginning.

Make data relatable. Put numbers and facts in context. 250 thousand square miles means nothing. It's the size of Texas!

Wetlands Destruction



Coastal marshes absorb fertilizer runoff from farms and buffer civilization from Gulf storms.

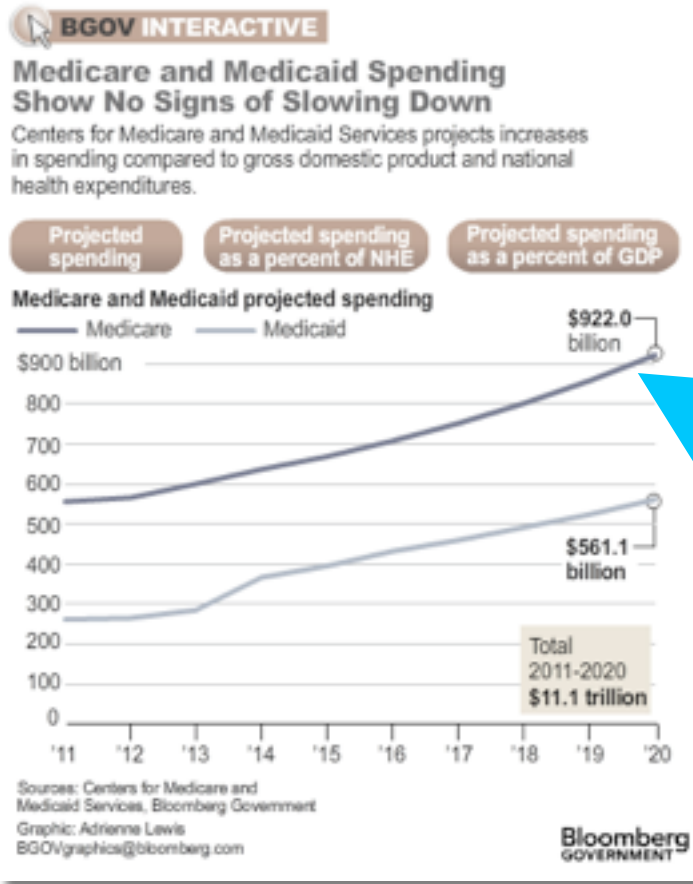
Losses in coastal watersheds, 1998 to 2004

Great Lakes	20,000	acres
Atlantic	110,000	acres

Aug 16, 2010

Mind your precision.

Significant digits, tickmarks, and labels suggest what deserves attention.

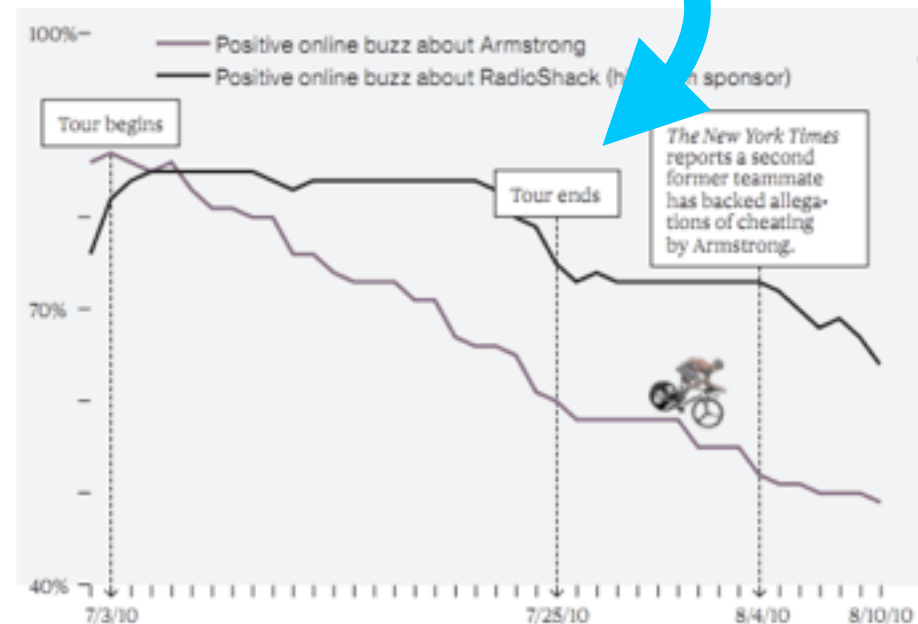


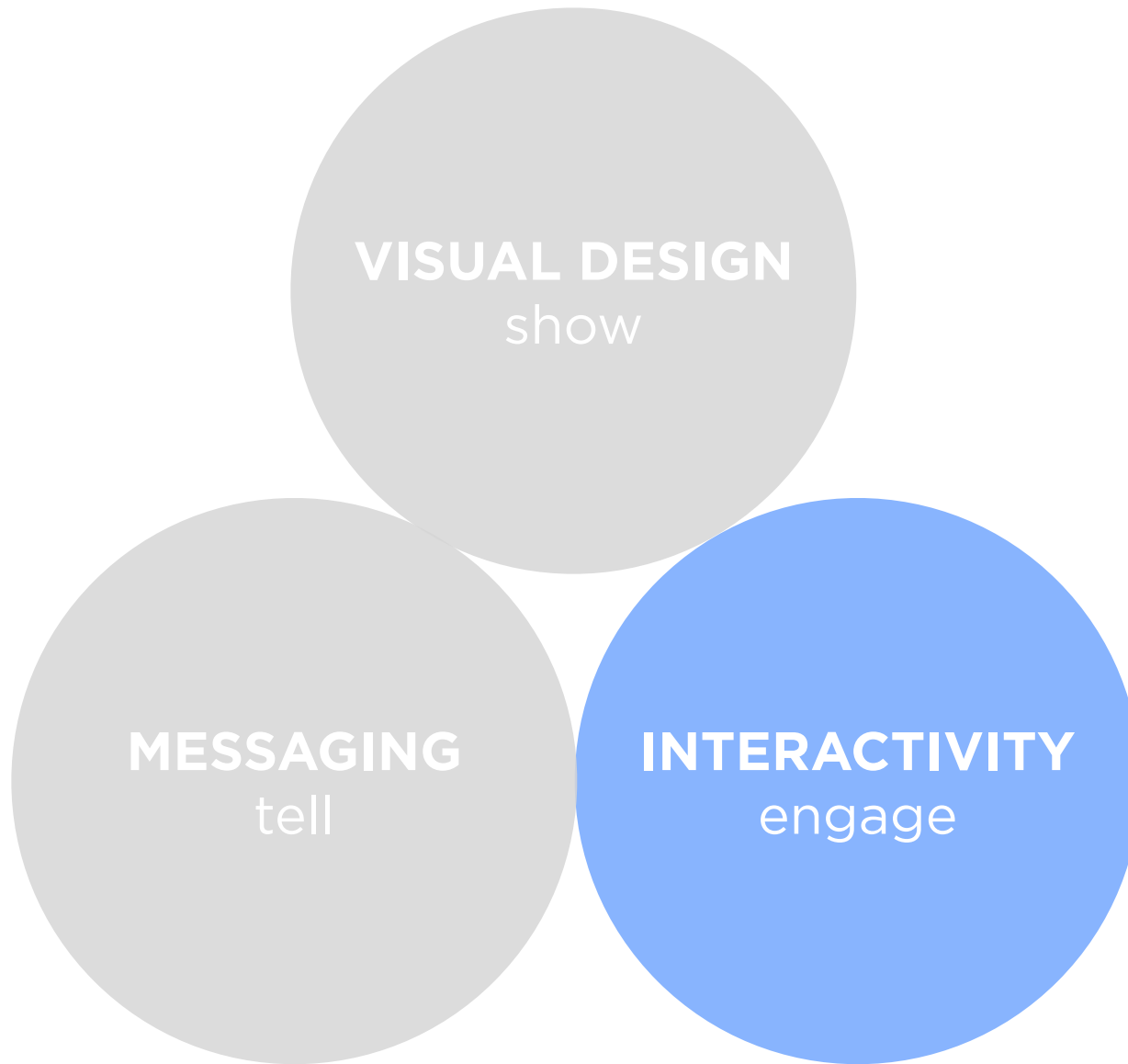
too precise

thoughtful

fine

Representative	District	Fiscal 2010 contract spending
Mike Coffman	Colo. 6	\$3.26 billion
Doug Lamborn	Colo. 5	2.98 billion
Rob Bishop	Utah 1	2.76 billion
Kenny Marchant	Texas 24	2.58 billion
Jeff Duncan	S.C. 3	2.48 billion
Sandy Adams	Fla. 24	2.36 billion
Lamar Smith	Texas 21	1.65 billion
Steve Scalise	La. 1	1.49 billion
Jeff Landry	La. 3	1.47 billion
Roscoe Bartlett	Md. 6	1.44 billion
John Carler	Texas 31	1.42 billion



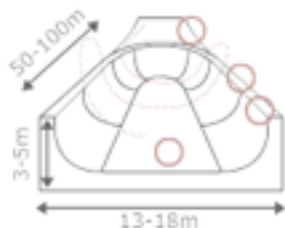


Interactive features should scream interactivity. Avoid a click-and-seek experience.

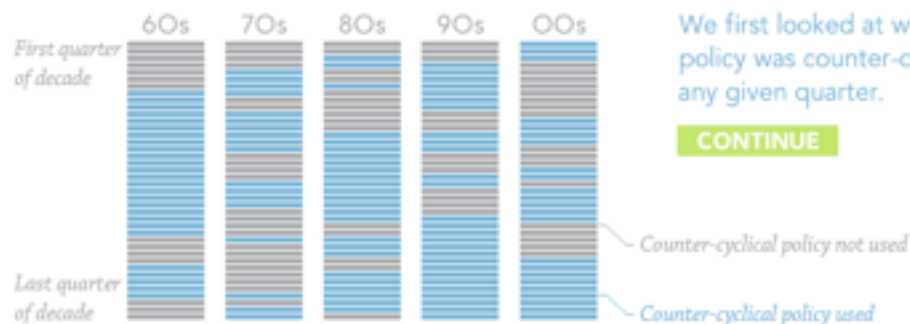
Be explicit.



suggested actions

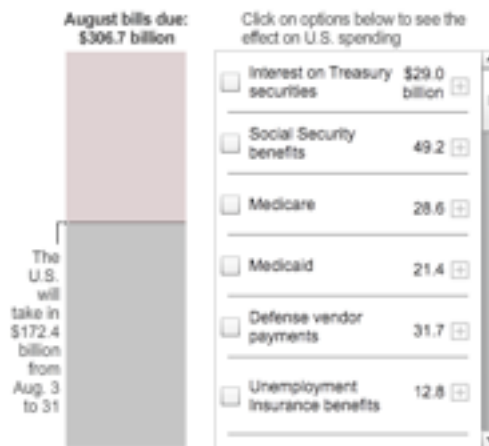


visual cues



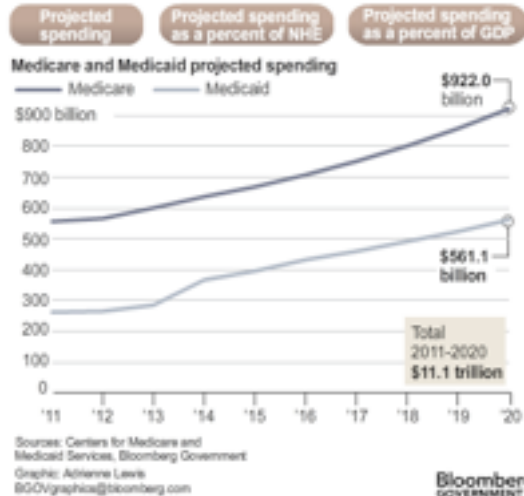
Source: Bloomberg

familiar widgets



Medicare and Medicaid Spending Show No Signs of Slowing Down

Centers for Medicare and Medicaid Services projects increases in spending compared to gross domestic product and national health expenditures.

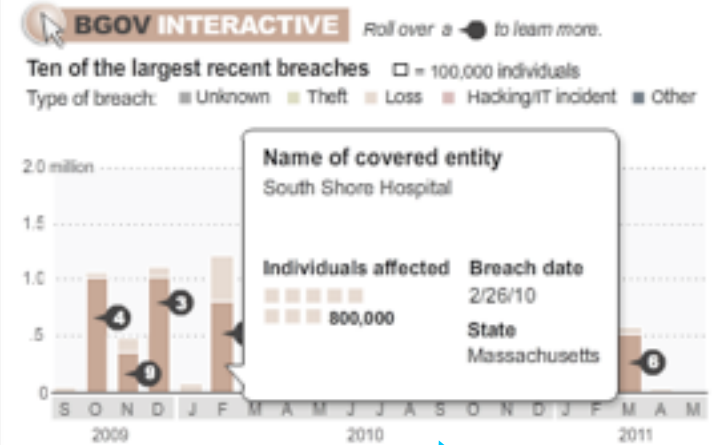


Interactive features should react to the user.

Depress buttons, highlight items, animate widgets.

Health Care's Growing Concern Over Cyber Security

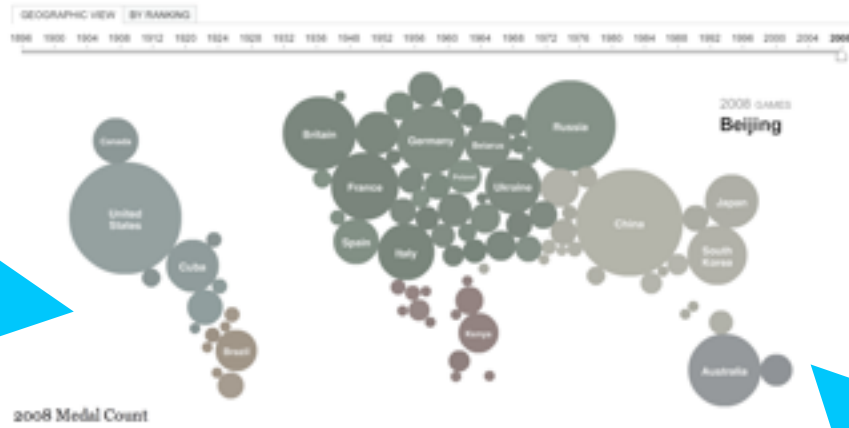
As health-care providers increasingly adopt electronic records, they are looking for insurance coverage against possible data breaches.



Roll over the countries



Don't obscure data.
Avoid letting pop-ups obscure data.



Make the visualization “look alive”.
Things move even without the user!

Demonstrate interactivity.
Animate interactive widgets for tacit tutorials.

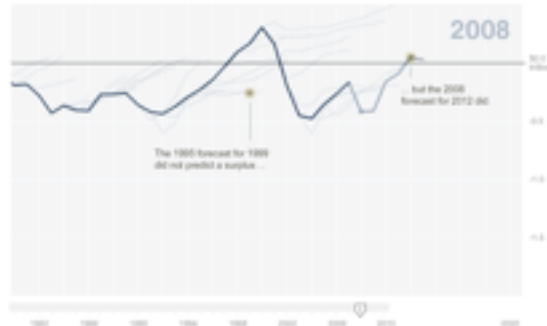
Budget Forecasts, Compared With Reality

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

1 2 3 4 5 6 7 8 9 10 11 12

Past forecasts

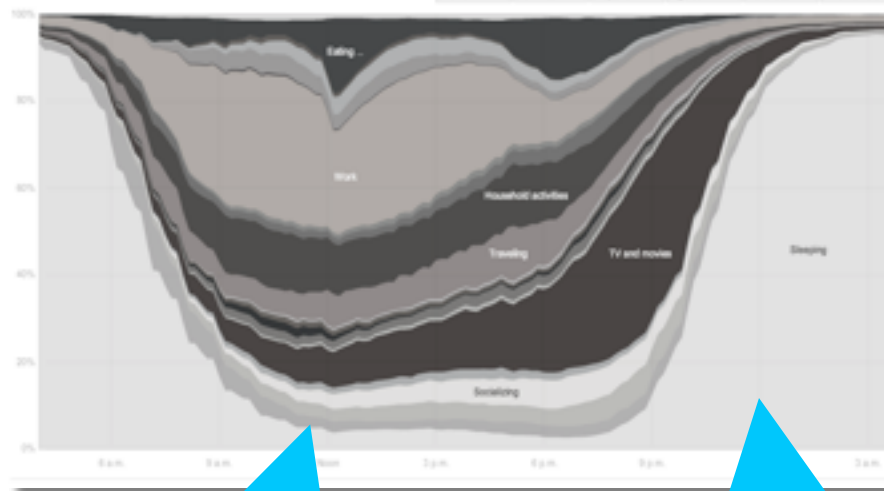
In contrast, just two years ago, the Bush administration projected a surplus by 2012.



Everyone

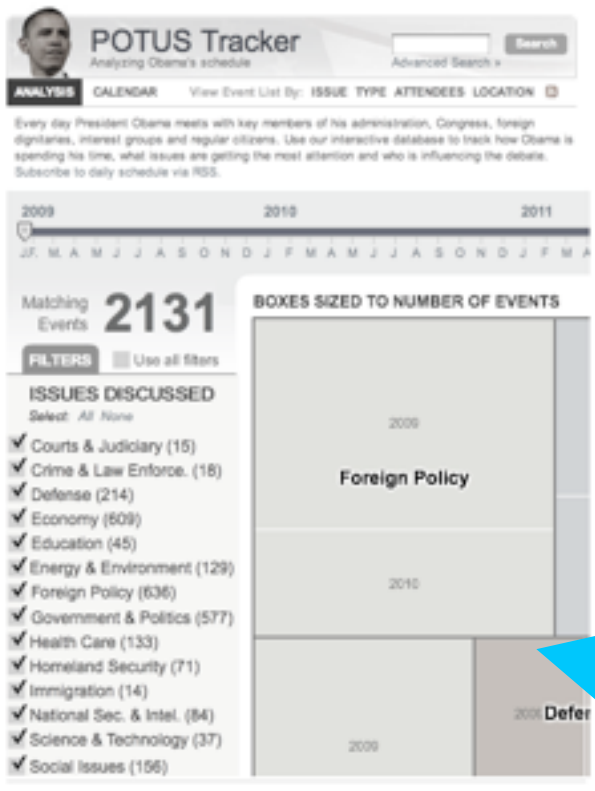
Sleeping, eating, working and watching television take up about two thirds of the average day.

Everyone	Employed	White	Age 15-24	H.S. grads	No children
Men	Unemployed	Black	Age 25-64	Bachelor's	One child
Women	Not in lab...	Hispanic	Age 65+	Advanced	Two+ children



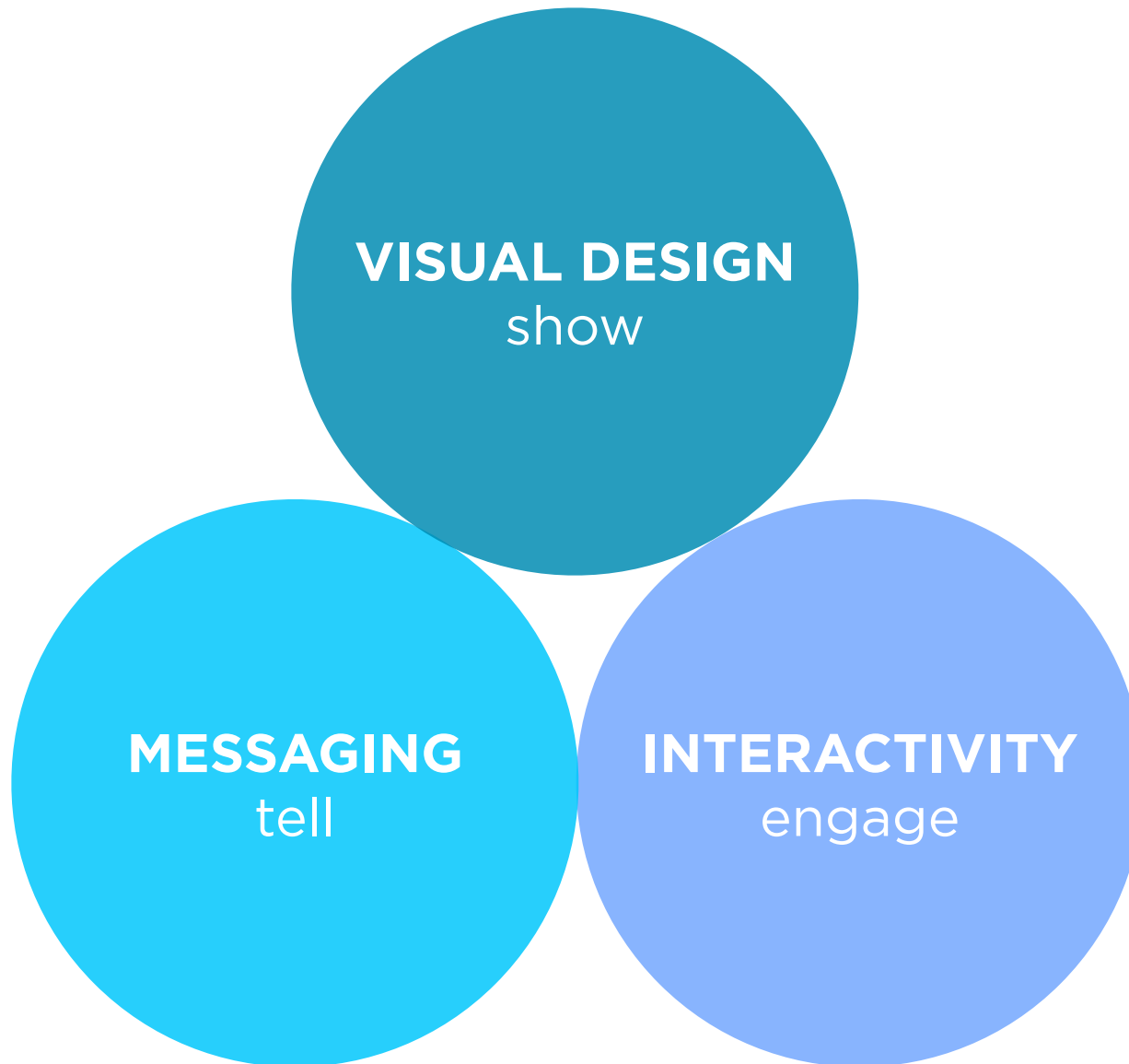
Include a progress bar and “back” and “reset” buttons

Linear navigation is important—especially with lots of interactivity.



Restrict interactivity to key dimensions. The more interactivity, the less story.

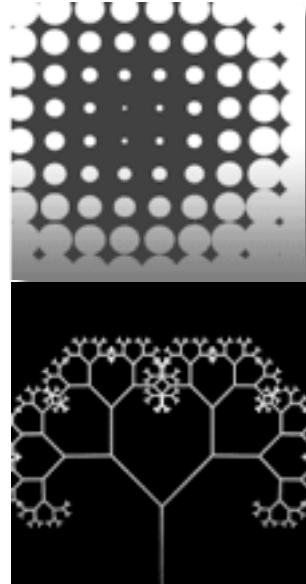




Sound & Video



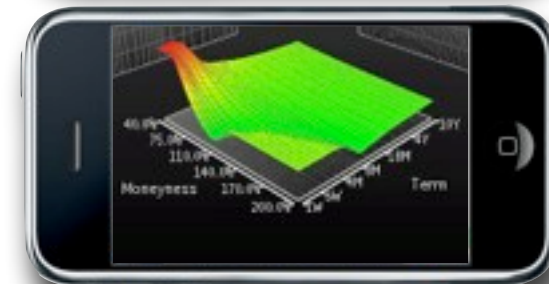
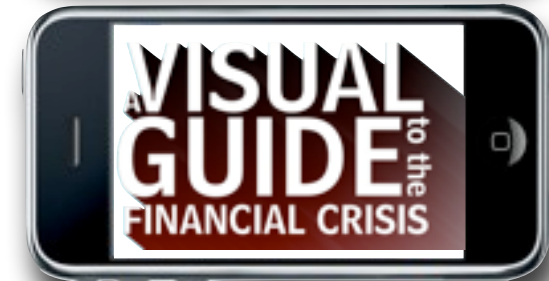
Fluid



Linking



Mobile



WHAT'S

NEXT

DATA JOURNALISM
IS NOT GRAPHICS AND
VISUALIZATIONS. IT'S ABOUT
TELLING THE STORY IN THE BEST WAY POSSIBLE.
SOMETIMES THAT WILL BE A VISUALIZATION...
BUT SOMETIMES IT'S A NEWS STORY. SOMETIMES, JUST
PUBLISHING THE NUMBER IS ENOUGH.

SIMON ROGERS, THE GUARDIAN // 2011

PEOPLE HAVE BEGUN TO FORGET HOW
POWERFUL HUMAN STORIES ARE,
EXCHANGING THEIR SENSE OF EMPATHY FOR
A FETISHISTIC FASCINATION WITH DATA...
THE HUMAN STUFF IS THE MAIN STUFF,
AND THE DATA SHOULD ENRICH IT.

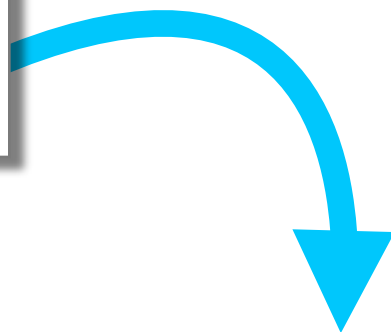
JONATHAN HARRIS // 2008

VISUALIZATION

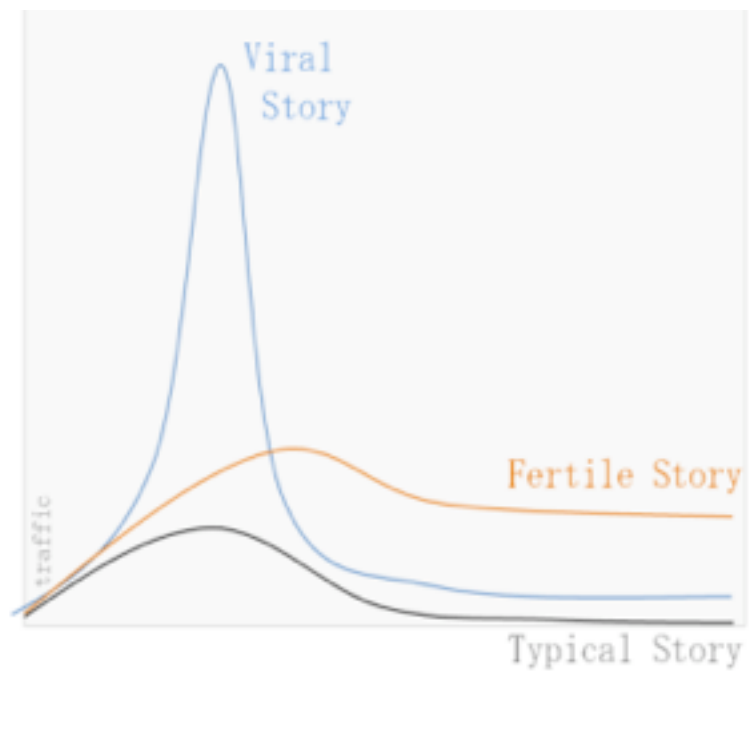
& JOURNALISM

Interactive Visualizations Drive Traffic

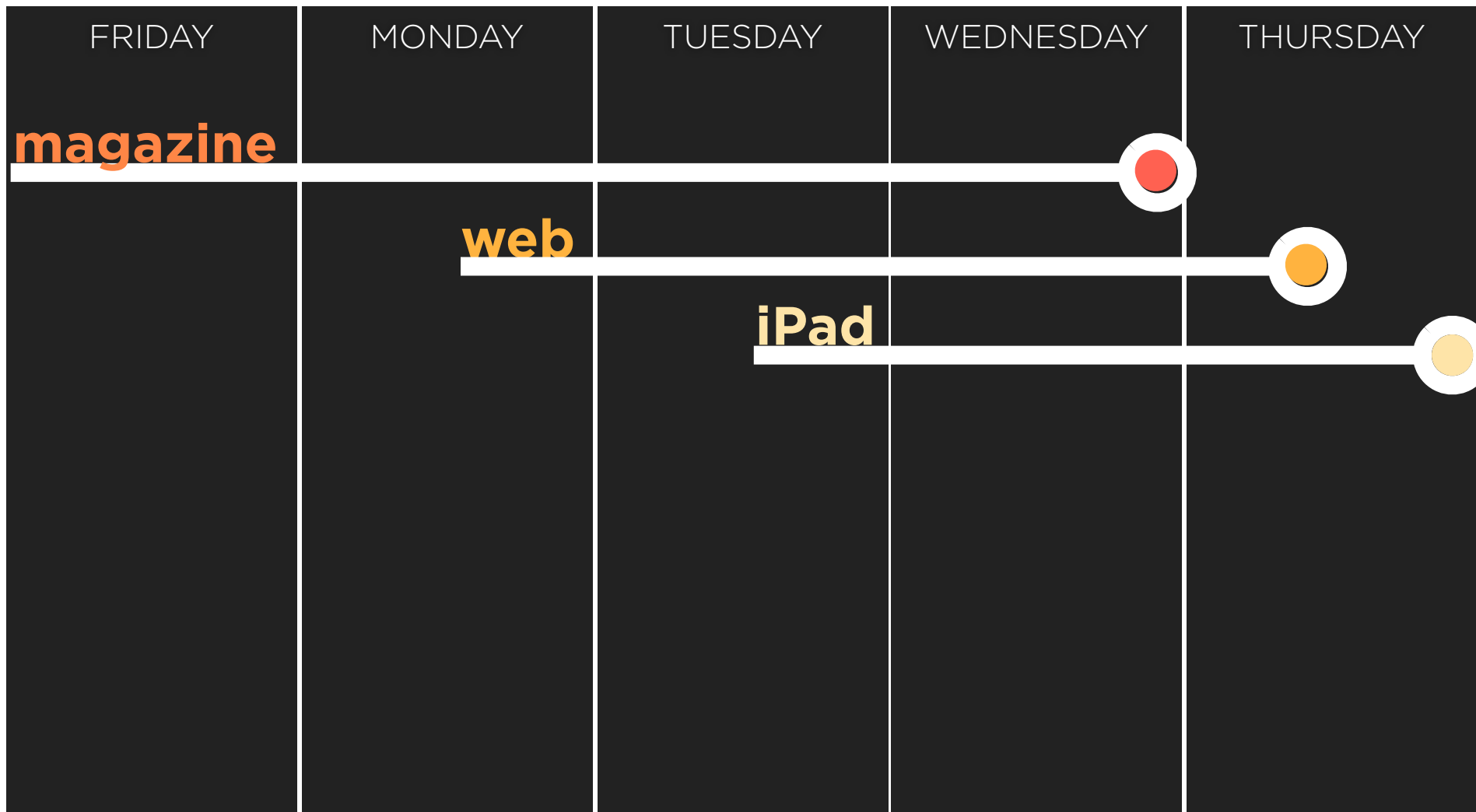
Slow burn vs. Burn out



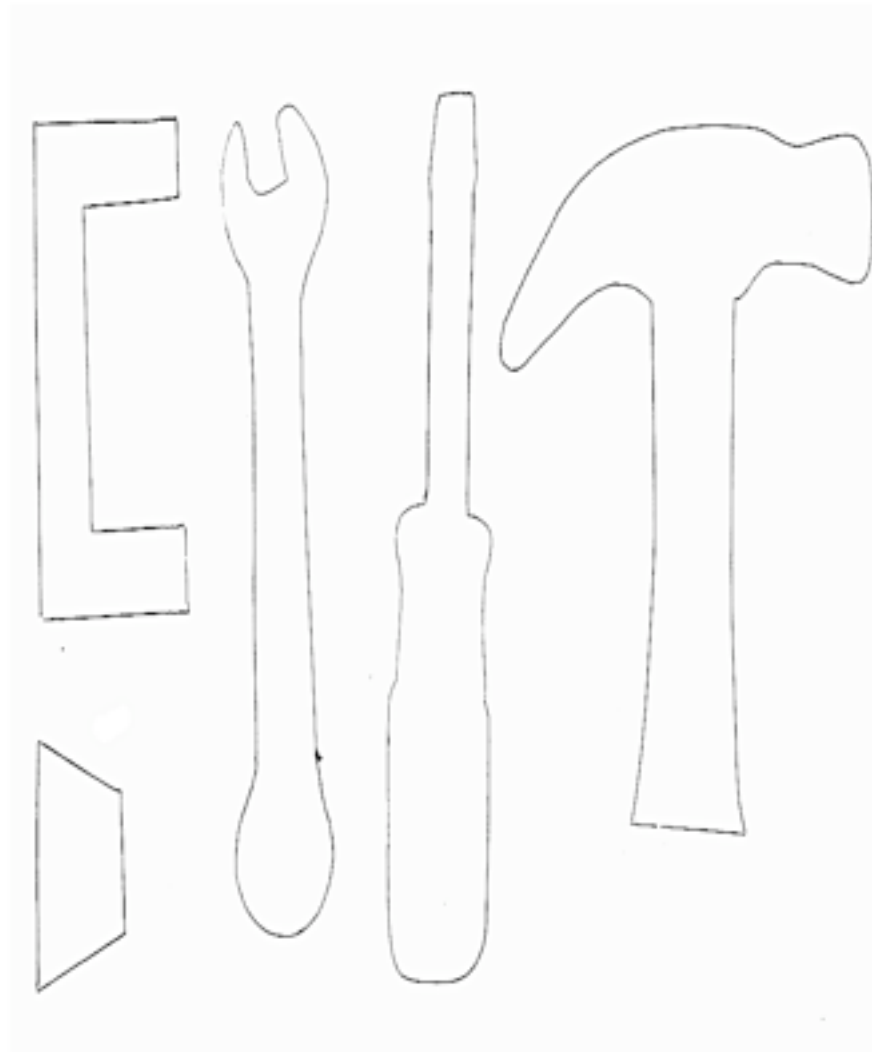
require significantly more work than traditional articles. To make this work economical, visualizations are added to stories that are either *persistent* or *viral* in order to generate traffic. **Persistent stories** cover thematic themes” that maintain relevance over time (e.g., crisis, food economics, the housing market). Adding visualizations to persistent themes “fattens and elongates” the stories (which are already fatter and longer). During this slow-burn, these visualizations are shared by hundreds of stories over several months and slowly evolve. **Viral stories** achieve heavy traffic in punctuated spikes of popularity. These stories tend to focus on celebrity, personalities, or sensational news. To get the most bang for the buck, produce visualizations for editorial content that is either *persistent* or *viral*.



Fast Turnaround
What can be done quickly?



Print to Digital



Templates & Tools

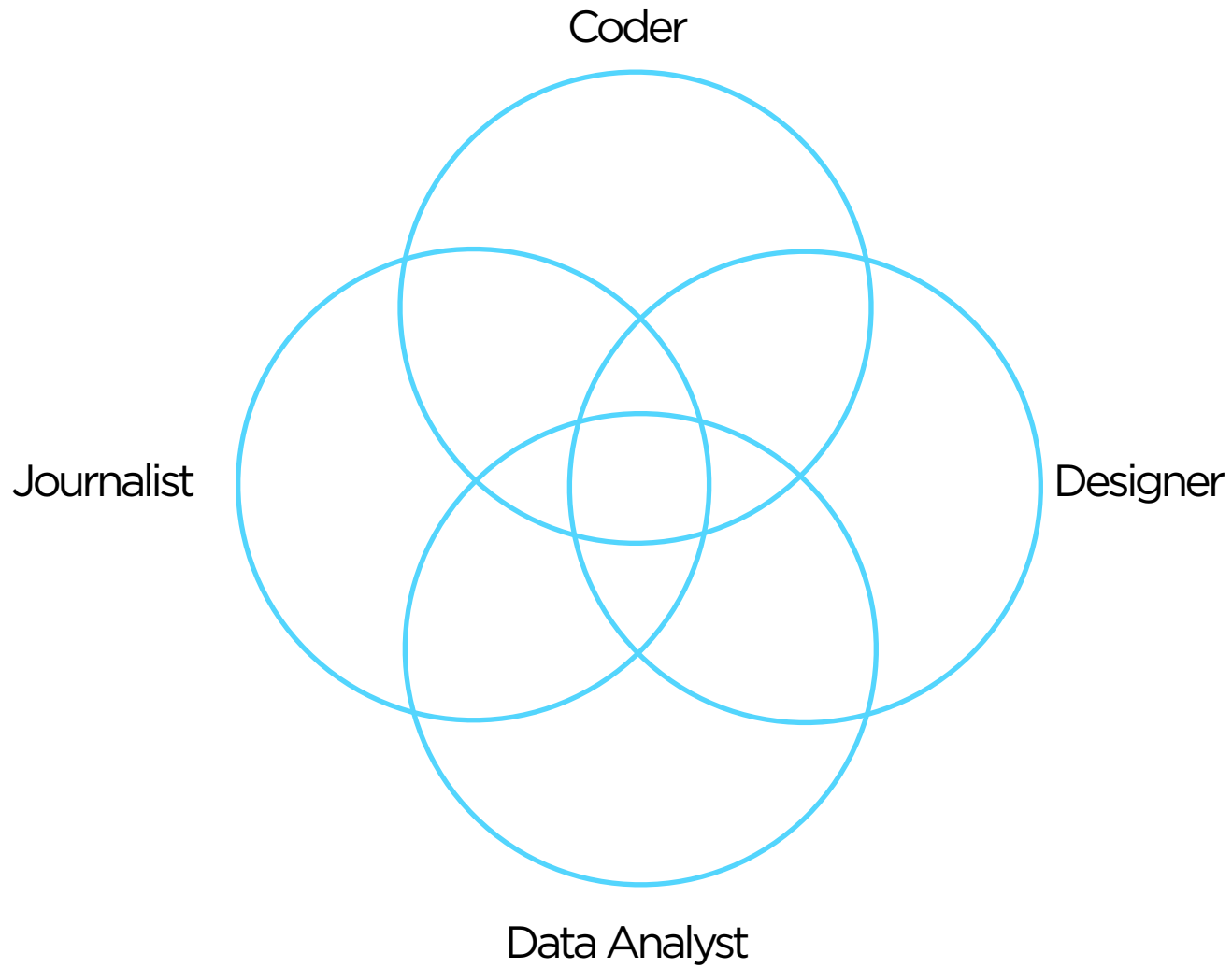
High demand for visualization tools
for non-technical journalists

What are the
big seminal themes
over the next year?

Build visualizations that
update with those themes...

Link to them every
chance you get!

Magical Candidate
Who has all these skills?



- (1) Choose your visualization type carefully.
Know your options. Even obscure ones.
- (2) The more linear, the more like a story.
Stories have a beginning, middle, and end.
- (3) Use establishing shots.
Situate the viewer before diving in.
- (4) Make it clear what to look at and when—especially where to start.
Guide readers through the story or they'll get lost.
- (5) Limit complexity at first. Reveal as needed.
Don't confuse the reader with extraneous information.
- (6) Consistent visual frameworks.
Keep things tidy.
- (7) Use staging and animation for complicated transitions.
Stage big transitions to avoid confusing readers
- (8) Design Matters.
Duh.
- (9) Avoid “chart junk” (Tufte).
Extra marks distract from the data.
- (10) “Cool” and “*readability*” are at odds.
Recognize the trade-off and choose your audience.

MESSAGING

tell the story

- (1) The more text, the more storytelling.
Graphs are abstract. Words give concrete interpretations.
- (2) Say the point you're making with the graphic.
Don't make the reader figure it out on his own.
- (3) Use headlines, captions, & annotations.
Quickly draw attention to what's important.
- (4) Weave text into the graphic—not just the beginning.
Text and graphics work better together than apart.
- (5) Start with an editorially interesting view.
Default views can be boring. Curate the experience from the beginning.
- (6) Make data relatable. Put numbers and facts in context.
250 thousand square miles means nothing. It's the size of Texas!
- (7) Connect the text to the relevant graphics.
See Fig. 5
- (8) Don't ignore summaries & conclusions.
Answer the “so what?” or the reader leaves empty handed.
- (9) Mind your precision.
Significant digits, tickmarks, and labels suggest what deserves attention.

(1) Demonstrate interactivity.

Animate interactive widgets for tacit tutorials.

(2) Interactive features should scream interactivity.

Avoid a click-and-peek experience.

(3) Interactive features should react to the user.

Depress buttons, highlight items, animate widgets.

(4) Restrict interactivity to key dimensions.

The more interactivity, the less story.

(5) Make the visualization “look alive”.

Things move even without the user!

(6) Don’t obscure data.

Avoid letting pop-ups obscure data.

(7) Include a progress bar and “back” and “reset” buttons

Linear navigation is important—especially with lots of interactivity.

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