HOW TO TELL STORIES WITH DATA (REALLY)
edward segel
data

computers

numbers

humans

visualization

...
why interactive?
why interactive?

Analysis

Personalization

Social

Storytelling

**Businessweek**
Top 100 M&A Deals

**BGOV**
Federal Spending

Ask. Explore. Find.
Too much info at once.
Scenario testing.
why interactive?

- **NYTimes** Jobless Rate for People Like You
- **Aaron Koblin** Arcade Fire’s Wilderness Downtown
- **NYTimes** Households like Yours

Make relevant. Increase engagement. Make emotional.

**ANALYSIS**

**PERSONALIZATION**

**SOCIAL**

**STORYTELLING**
why interactive?

- **Analysis**
  - Stamen Design
  - MTV VMA
  - Twitter

- **Personalization**
  - Aaron Koblin
  - Sheep, Cash, Bicycle

- **Social**
  - NYTimes
  - Reactions to Osama

- **Storytelling**
  - Sharing.
  - Collaborative.
  - Real-Time sentiment.
why interactive?

ANALYSIS

PERSONALIZATION

SOCIAL

STORYTELLING
interactive storytelling is...

- A new way of telling stories
- A guided tour through data
- Interactive and engaging
- Becoming wildly popular
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
HOW CAN YOU TELL STORIES WITH DATA?
Privacy and the returned

Lives of others

Facebook and Google face a dual threat from users and regulators alike — the way they have handled sensitive data.

Jennifer Stoddart, Canada’s privacy commissioner, renegotiated with Facebook in August after the social networking site agreed to change its practices within a year to comply with the country’s privacy laws. Now, says Stoddart, the company appears to be weighing an important part of the deal, which included giving users more control and transparency on how their data is shared with third parties. It doesn’t seem to be that Facebook is going in the right direction or that, says Stoddart, “It doesn’t seem to me that Facebook has changed its privacy policy in any way. They’ve said they’ll consult with users before making changes, but it’s not clear how involved users will be in the consultative process.”

This is likely to stop the current rise of Facebook, which is poised to claim half of all Internet traffic and which directly or indirectly makes the platform an invisible service. In the not-so-distant future, we may see the Facebook logo on our cellphones, or even on our own heads, as a way to keep track of our friends and family. Facebook’s move is almost certainly in an effort to entice disaffected Facebook users to its services.

The move to Facebook’s handling of privacy has been an ongoing process. In December, the social networking site changed the way it collected and shared users’ data in a way that users might not have been aware of. Facebook argued that its change was necessary to protect user privacy. But disaffected Facebook users lobbied for the change to be reversed.

The switch should not have come as a surprise, says Stoddart. "It’s not clear whether Facebook will fully support users’ privacy concerns, but it’s a step in the right direction."
exciting!
beautiful!
technical!

BUT

what does it mean?
Budget Forecasts, Compared With Reality

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

Latest forecast

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

Use the slider to isolate a single year’s forecast.

... but the 2008 forecast for 2012 did.

The 1995 forecast for 1999 did not predict a surplus ...
THE NARRATIVE FRAMEWORK
58 CASE STUDIES

70% Journalism
20% Business
10% Research
Visual Design

Messaging
- Summaries
- Interpret
- Headlines
- Attached Article
- Captions
- Duo-Specific Annotations

Interactivity
- Timelines
- Navigation
- Filtering
- Tacit Tutorial
- Selection
- Details on Demand
- Highlighting
Genres + Interactivity + Messaging = DESIGN SPACE

**Author Driven**
- strong ordering
- heavy messaging
- limited interactivity

**Reader Driven**
- weak ordering
- light messaging
- free interactivity

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**STORYTELLING**
- CLARITY
- SPEED

**ASK QUESTIONS**
- EXPLORE
- FIND

---

**martini**
**glass**

**interactive slideshow**
**drill-down story**
THE DESIGN CATALOGUE
**Visual Design**
- Show

**Messaging**
- Tell

**Interactivity**
- Engage
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.
Avoid “chart junk” (Tufte). Extra marks distract from the data.

But... chart junk may reflect cool design choices.

Businessweek... does great with labeling only as much as needed.
World Population: 6,853,328,460
Migrants in the world: 215,738,321

Almost 216 million people, or 3.15% of the world population, live outside their countries.

Click on a country box to know more about migration flow to/from that country.

Make it clear where to start.
Don’t let readers defect.
The more linear, the more like a story.
Stories have a beginning, middle, and end.
Consistent visual frameworks. Keep things tidy.

The Social Network

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
2010 a year in reviews

Here are all the albums reviewed by Pitchfork in 2010. Explore albums by hovering over the album art or using the search bar. Click the filters to see only the year's best music. When you find an album you like, click to open the review. Enjoy the year in reviews.

Note: This site is completely and totally unaffiliated with pitchfork.com.

search album or artist name

☐ AI
☐ Best New Music
☐ Top 50 of 2010

Owen Pallett
Heartland

8.6  best new music

[Domino / 2010]  Click for Review

edward.segel@gmail.com 2010
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.
Use establishing shots. Situate the viewer before diving in.

In Chapter One we talked about one such opportunity for giving readers a sense of place: the "establishing shot."

Y'know, those big long-shot panels that tell you where you are, usually before zooming in to the protagonist?

That one for example.

Well, if just telling your readers where the story takes place is your primary goal --

-- you can probably get by with just one or two panels of straightforward, economically drawn establishing shots per scene.

-- which usually require less work than, say, drawing 700 leaves every time you want to put a tree in the panel.

-- and close-ups --

I mean look at that thing -- it's a squiggle for Pete's sake! But you know it's a tree based on the panels before.
CONTINUED...

Use establishing shots. Situate the viewer before diving in.
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.
755

Steroids or Not, the Pursuit Is On

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

Lines are cumulative home runs.

Hank Aaron
755 homers
23 seasons

Babe Ruth
740 homers
22 seasons

Barry Bonds
708 homers
20 seasons

Bonds takes lead
Home runs after 16 seasons
Bonds 657
Aaron 554
Ruth 516

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.

Aaron
Actual homers slightly outpace projected home runs for five seasons.

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

Bonds
From age 35 to 38, he averaged 14 more home runs a season than projected.

Note: Ages as of July 1 of each season.

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 (97th) and Pujols (99th).

Hank Aaron
735

Babe Ruth
714

Barry Bonds
708

Willie Mays
660

Sunny Sosa
598

Frank Robinson
586

Mark McGwire
584

Ken Griffey Jr.
530

Alex Rodriguez
429

Albert Pujols
201

16 times hit 30 or more (M.L. most)
Hit only 20 over first five seasons.
Averaged 52 from 2000 to 2004.
Averaged 52 from 1950-59.
Triple Crown in '66
First to hit 70 in a season
Youngest to reach 400 home runs
Second most home runs in first five seasons.
Steroids or Not, the Pursuit Is On

Barry Bonds is taking aim at the career home run record. His need, only six more to tie Babe Ruth and 47 to equal Hank Aaron.

According to allegations in a book about Bonds, he began taking steroids before the 1999 season. He hit 47 that year in the Netherlands. Two seasons later, he hit 73 home runs, surpassing Aaron's career pace.

Homer Pace After Age 34

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

Ruth
Averaged 46.4 homers in 34 seasons from age 20 to 34. Averaged 42.5 for next four seasons.

Bonds
From age 35 to 36, he averaged 14 more homers a season than projected.

Hank Aaron
755 home runs

Babe Ruth
714 home runs

Barry Bonds
708 home runs

Willie Mays
660

Sunny Sosa
588

Frank Robinson
586

Mark McGwire
583

Ken Griffey Jr.
536

Alex Rodriguez
429

Albert Pujols
201

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 (97th) and Pujols (tied 257th).

- Hank Aaron: 735
  - Hit only 20 or over in first five seasons.
  - No one hit more than 65 in 1955 to 89.
  - Three 60-homer seasons is record.
  - Triple Crown in '66 (49, 122, 318).
  - First to hit 70 in a season.
  - Only McGwire had more in the 90s.
  - Youngest to reach 400 home runs.

- Babe Ruth: 714
  - 16 times hit 30 or more (M.L. most).
  - 1919-26 hit 50 or more.
  - Hit 60 in 1927.

- Mark McGwire: 583
  - Averaged 31 from 1987 to 98.
  - Hit 70 in 1998.
  - Hit only 20 or over in first five seasons.

- Ken Griffey Jr.: 536
  - 2001 hit 50 or more.
  - Hit only 20 or over in first five seasons.

- Alex Rodriguez: 429
  - Hit 20 or over in first five seasons.

- Albert Pujols: 201
  - Hit 20 or over in first five seasons.
Steroids or Not, the Pursuit Is On

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

Here are projected home run rates for each player after age 34.

Aaron:
- Actual homers slightly above projected.

Ruth:
- Averaged 46.4 actual.
- Averaged 42.5 projected.

Bonds:
- From age 35 to 36, he averaged 14 more home runs than projected.

Home: Ages as of July 1 of each season.

Homer Pace After Age 34

If the allegations are correct, Bonds was 24 in his first season on steroids and he did not hit 61 home runs.

According to allegations in a book about Bonds, he began taking steroids before the 1999 season. He hit 41 home runs. He hit 73 home runs, surpassing Aaron's career pace.

Differing Paths to the Top of the Charts

The top seven players on the career home run list, along with a look at Griffey (128), Rodriguez (927) and Pujols (tied at 267):
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.
INTERACTIVITY  
engage

MESSAGING  
tell

VISUAL DESIGN  
show

INTERACTIVITY  
engage

MESSAGING  
tell

VISUAL DESIGN  
show

INTERACTIVITY  
engage

MESSAGING  
tell
Paths to the Top of the Home Run Charts

The players with the most home runs are shown below; click on a player’s name or on a line below to highlight a player’s trajectory.

Hank Aaron
755 home runs

In 1974, Aaron broke the home run record that Ruth set in 1935.

1. Bonds 792
2. Aaron 755
3. Ruth 714
4. Mays 680
5. Griffey 630
6. Sosa 609
7. Rodriguez 599
8. Robinson 536
9. McGwire 583
10. Thome 577
11. Killebrew 573
12. Palmeiro 509
13. Jackson 563
14. Ramirez 554
15. Schmidt 548
16. Mantle 536
17. Foxx 534
18. McCovey 521
19. Thomas 521
20. Williams 521
21. Banks 512
22. Mathews 512
23. Ott 511
24. Sheffield 509
25. Murray 504

Ted Williams was a Navy pilot in World War II.

Chadwick's work on the chart of the history of baseball probably still stands as the most important of its kind. Chaddick's chart, however, was one of the first to take advantage of the possibilities of media, using graphs to illustrate important points.

Base jumping

Metal prices, $ terms, January 1st 2008=100

Source: London Metal Exchange
June 20, 2011

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

require significantly more work than traditional graphics. To make this work economical, visualizations often lead 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). As stories transform into persistent themes, “fattens and elongates” the visualization (which are already fatter and longer stories). During this slow-burn, these visualizations are enhanced by hundreds of stories over several months as the stories evolve. Viral stories achieve heavy traffic by punctuated spikes of popularity. These stories tend to contain a mix of technology, personalities, or sensational news. To get the “in the right vein, produce visualizations for editorial content that is not or viraled.
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 4,300 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 filled 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 “dull 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 Antonin 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 filled 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.

Our View The Supreme Court was right.
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.
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!
Mind your precision.
Significant digits, tickmarks, and labels suggest what deserves attention.

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.

<table>
<thead>
<tr>
<th>Representative</th>
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<td>Mike Coffman</td>
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<tr>
<td>John Carter</td>
<td>Texas 31</td>
<td>$1.42 billion</td>
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</table>

*Fine: Too precise*

*Thoughtful: Fine*

*The New York Times reports a second former teammate has backed allegations of cheating by Armstrong.*
Interactive features should scream interactivity.
Avoid a click-and-seek experience.

Be explicit.

Click here.

suggested actions

visual cues

familiar widgets

We first looked at whether policy was counter-cyclical in any given quarter.

CONTINUE
Interactive features should react to the user. Depress buttons, highlight items, animate widgets.

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

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.

Ten of the largest recent breaches
- Individuals affected: Number of individuals affected by each breach
- Breach date: Date of the breach
- Covered entity: Name of the covered entity
- State: State where the breach occurred
- Type of breach: Type of breach

Name of covered entity
South Shore Hospital

Individuals affected: 800,000
Breach date: 2/26/10
State: Massachusetts

Roll over the countries
Key:
- In recession
- Out of recession
- Dodged recession
- Runaway growth

Italy
Peak to trough GDP
-6.5%
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 a crisis. How accurate were our White House budget forecasts here?

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

The 2005 forecast for 2009 did not predict a surplus.
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
Interactive Visualizations
Drive Traffic
Slow burn vs. Burn out

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**Print to Digital**

**Fast Turnaround**

What can be done quickly?
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?

Coder

Data Analyst

Designer

Journalist
the importance of domain expertise
(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.
(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-seek 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.

New York Times. How many households are like yours?

New York Times. The Death of a Terrorist: a Turning Point?

http://www.nytimes.com/ref/sports/20070731_BONDS_GRAPHIC.html


New York Times. Aerial Photographs of Joplin Before and After the Tornado

New York Times. How different groups spend their day.


New York Times. Alpine Skiing, From Technical Turns to Tucks and Speed


The Guardian
Guardian. Toyota's sticky accelerator problem.
http://www.guardian.co.uk/business/interactive/2010/feb/04/toyota-automotive-industry

Guardian. Shaun White's Double McTwist.
http://www.guardian.co.uk/sport/interactive/2010/feb/19/winterolympics2010-vancouver

Guardian. Earthquakes: Why they happen.
http://www.guardian.co.uk/world/interactive/2008/jan/23/earthquakes

Guardian. Oscars 2011: an interactive guide to this year's best picture nominees

Guardian. Inflation in the UK.

Guardian. The World's Economy Turns the Corner.
http://www.guardian.co.uk/business/interactive/2010/Jan/26/recession-gdp

Miscellaneous
Aaron Koblin. Personal website with work.
http://www.aaronkoblin.com/work.html

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