

Storytelling in InfoVis



CS 4460 – Intro. to Information Visualization
September 2, 2014
John Stasko

Purpose

Review



- Two main uses of infovis
 - Analysis – Understand your data better and act upon that understanding
 - Presentation – Communicate and inform others more effectively
- Today we look at that second one more

Telling Stories



- Data visualization can help to communicate ideas, summarize, influence, unite, explain, persuade
- Visuals can serve as evidence or support

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A Famous Example



The screenshot shows the TED website interface for the talk 'Hans Rosling shows the best stats you've ever seen'. The video player shows a man (Hans Rosling) speaking, with a 'gapm' logo visible in the background. The page includes navigation links, a search bar, and a sidebar with 'About this talk' and 'What to watch next' sections.

Hans Rosling
Gapminder

2006

http://www.ted.com/index.php/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen.html

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They Had Him Back



2007

http://www.ted.com/index.php/talks/hans_rosling_reveals_new_insights_on_poverty.html

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Discuss



- Why has this had such a big impact?

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InfoGraphics

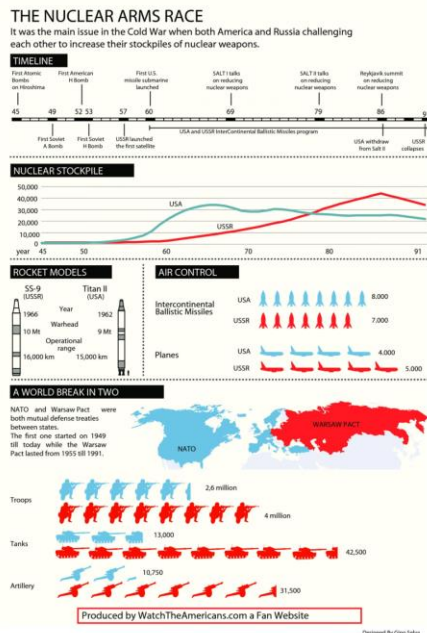


- See them everywhere today
- Perhaps a good example of infovis for presentation purposes
 - Typically not interactive though

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<http://visual.ly/nuclear-arms-race>

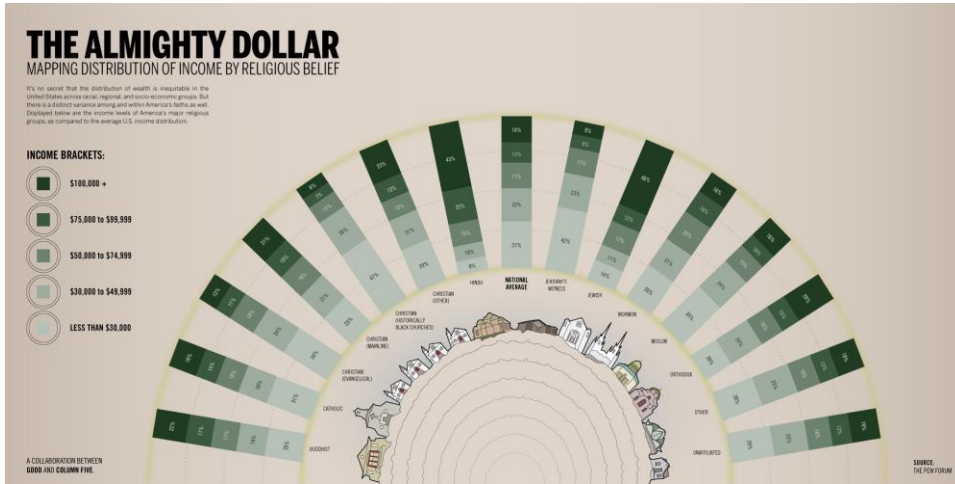


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<http://awesome.good.is/transparency/web/1002/almighty-dollar/transparency.jpg>

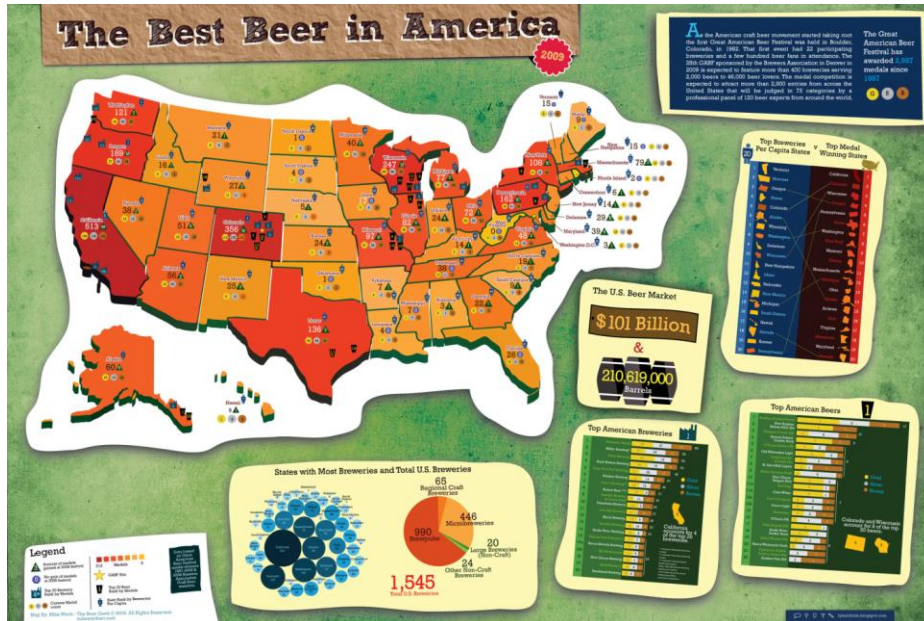


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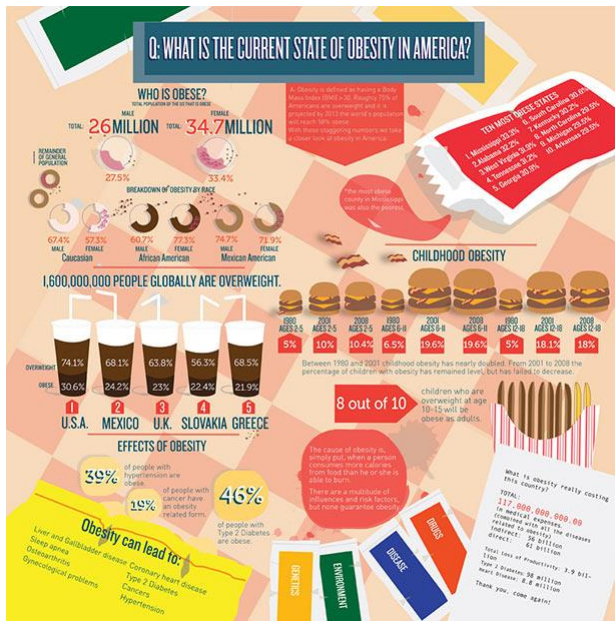
<http://www.mikewirthart.com/?cat=3>



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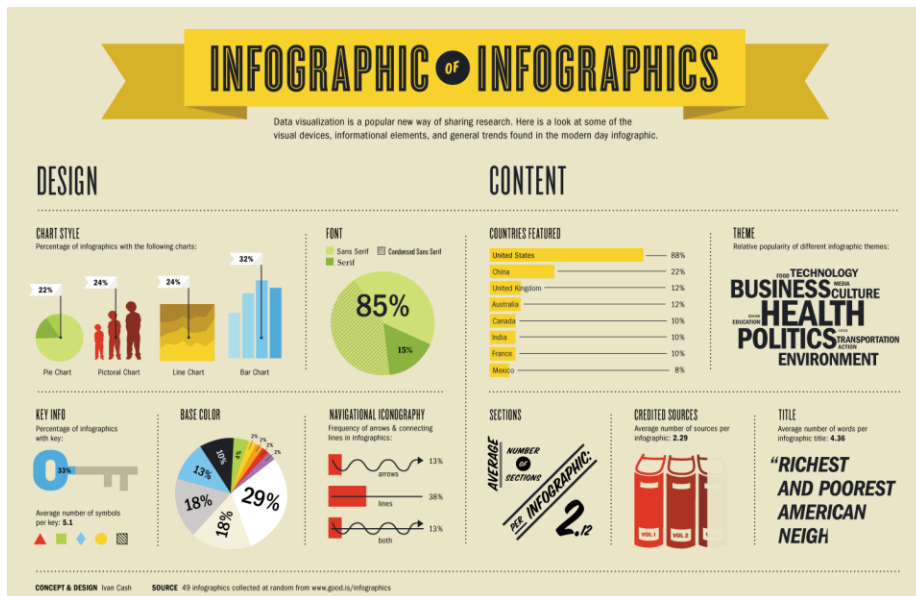
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A Lead Paper

Segel & Heer
TVCG (InfoVis) '10



- Studied storytelling: Described topics as “Narrative Visualization”
 - How does this differ from traditional forms of storytelling
 - Reviews the design space
 - Characterizes genres
 - Describes a framework

IEEE TRANSACTIONS ON VISUALIZATION AND COMPUTER GRAPHICS, VOL. 16, NO. 6, NOVEMBER/DECEMBER 2010 1319

Narrative Visualization: Telling Stories with Data

Edward Segel and Jeffrey Heer

Abstract—Data visualization is regularly credited for its ability to reveal stories within data, yet these “data stories” often in important ways from traditional forms of storytelling. Storytellers, especially online journalists, have increasingly been integrating visualizations into their narratives. In some cases allowing the visualization to function in place of a written story. In this paper, we systematically review the design space of the emerging class of visualizations. Drawing on case studies from news media to visualization research, we identify distinct genres of narrative visualization. We characterize these design differences, together with interactivity and user control, in terms of the impact between the variables first proposed by the authors: complexity, graphical elements, and the methodological and story discovery on the part of the reader, using through narrative engagement. Our research suggests design strategies for narrative visualization, including prioritizing under-explored approaches to journalists, storytelling and educational readers.

Index Terms—Narrative visualization, storytelling, design methods, case study, journalism, social data analysis.

1 INTRODUCTION

In recent years, many have commented on the storytelling potential of data visualization. News organizations including the New York Times, Washington Post, and the Guardian regularly incorporate dynamic graphics into their publications. Politicians, activists, and information designers use narrative visualizations as a backdrop for speeches, digital health and wellness (DH) and education media (EM). A user interface in The Economist [1] explains the proliferation of digital data and uses the visualization design term “making the world’s complex science, business, aviation design and architecture”.

In this paper, we investigate the design of narrative visualizations and identify techniques for telling stories with data graphics. We take an empirical approach, analyzing visualizations from online journalism, blogs, instructional videos, and visualization research. After reviewing related work, we define the design space of narrative visualization through design strategies and identify an analytic approach. We then formulate a design space constructed from an analysis of 58 examples. The analytic identifies related dimensions of visual storytelling, including how graphical techniques and interactivity can enhance various levels of structure and narrative flow. We describe seven genres of narrative visualization, ranging from the minimalist (e.g., pie charts, bar charts, color maps, line plots, and tables). These genres can be combined with interactivity and messaging to produce varying balances of aesthetic appeal and reader-driven experience. Finally, we discuss the implications of our framework, noting emerging design strategies, promising yet under-explored approaches to integrating visualization with other media, and the potential for improved authoring tools for narrative visualization, and approaches to design and narrative elements of dynamic visualizations, not approaches from the attention to the cognitive and contextual experience of the reader. We summarize the contributions of these elements, however, and describe the

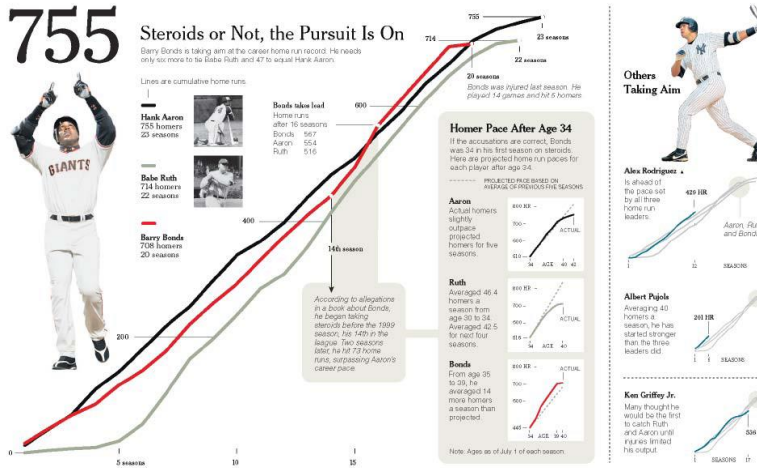
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Case Studies

NY Times 2006



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Design Space Dimensions



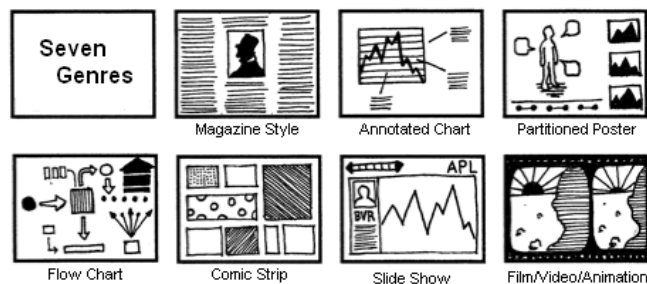
- Genre (next slide)
- Visual Narrative Tactics
 - Visual structuring
 - Highlighting
 - Transition Guidance
- Narrative Structure (non-visual mechanisms to assist narrative)
 - Ordering
 - Interactivity
 - Messaging

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Genres



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Observations



- Clusters of different ordering structures
- Consistency of interaction design
- Under-utilization of narrative messaging

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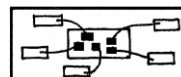
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Approach



- Author-driven vs. reader-driven
- Common patterns
 - Martini glass
 - Interactive slideshow
 - Drill-down story



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A Hot Topic

VisWeek 2010 Workshop
Reprised again Fall 2011
Continued papers at later InfoVis



TELLING STORIES WITH DATA
Using visualization to create narratives and engage audiences
A VisWeek 2010 Workshop

While visualization is an excellent tool for discovery and analysis, it is also a powerful medium for communication. The best information graphics do more than just present numbers; they tell a story, engage and connect their readers, invite them to make a personal connection to the data, and help them tell stories of their own.

This **VisWeek 2010** workshop examined the construction of narratives with visualization. We drew participants with interests in visualization, social media, journalism, and the humanities.

WHAT ARE SOME COMPLEX?
Data can speak to people in a variety of different ways with the right audience in the right context. A workshop approach can be developed. A good data narrative includes a strong perspective that tells a story. It engaged the reader through the data or encourage them to make observations. It designed how their audience will gather them to form a personal connection to the data, and most importantly, it guides the audience toward insights, or "ah-ha" moments that they can't see on their own or help them see facts in a different light. ...

There are a few of the data dimensions that were our inspiration for organizing this workshop.

Time and Place
This workshop took place on **Tuesday, October 26th, 2010**, from 8:30AM to 6:00PM, at the **VisWeek 2010 conference** in Salt Lake City, Utah, USA.

Program
[Go to printable version] [See all speaker abstracts and bios]

Time	Description
8:30	Welcome and workshop overview Albert R. Kinnick, Albert R. Kinnick, Karrie Karahutka
8:45	Short introductions

<http://thevcl.com/storytelling/>

FlowingData
Telling Stories with Data, A VisWeek 2010 Workshop

This is a guest post by Alan Dicks, who heads the IBM Visual Communication Lab. Matt Anderson, Karrie Karahutka, and Alan hosted a workshop on Telling Stories with Data. These are the highlights.

What is a story? In a classic sense, a story has characters, events, and a progression. In our particular, data visualization context, we also focus on how data informs the audience of the author and audience.

How what if the data makes sense? How does visualization support telling a story with data? How do journalists use data visualization as part of their stories? How can visualization tools help data storytellers construct a narrative?

All invited Salt Lake City, Matt Anderson, Karrie Karahutka, and Alan hosted a workshop to explore this topic of Telling Stories with Data. We were really motivated by our observation that people often use visualization to share personal perspectives about the stories and their audience.

For example, in May of this year, Matt also introduced an exploring how Facebook's default privacy settings have changed over time. To that end, we created a visualization to illustrate their evolution. Matt then posted the visualization to his website, along with some explanation that had further commented by point of view. After time, Facebook's privacy policy changes were a trending news topic, and the visualization spread rapidly through Twitter, Facebook, and several news blogs. Through use of attribution and appropriate metadata, this visualization had a simple yet compelling story. The information provided Facebook is useful to large and larger group of people.

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100 Million Time Series
DataMines

<http://flowingdata.com/2010/11/11/telling-stories-with-data-a-visweek-2010-workshop/>

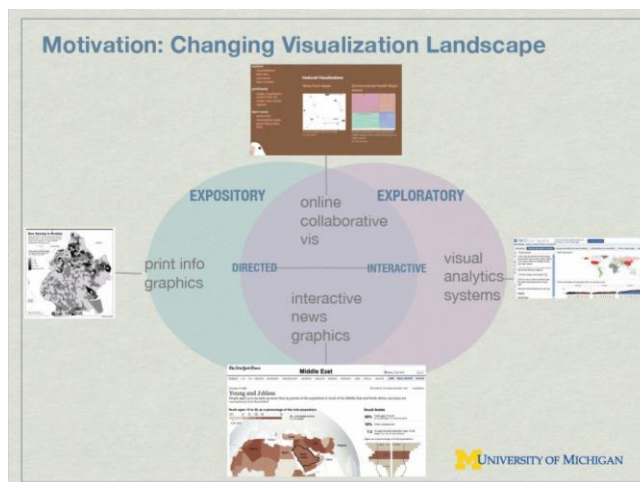
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http://thevcl.com/storytelling/docs/jessica_hullman.pdf

Narratology



Interesting talk at workshop

Jessica Hullman
Univ. Michigan

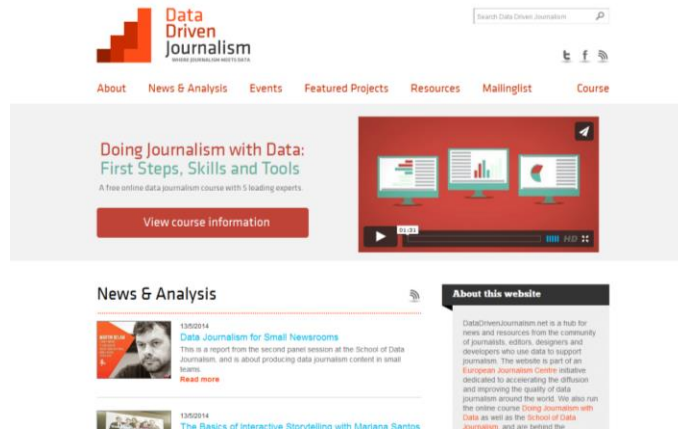
Expanded upon in subsequent papers

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Journalism Angle

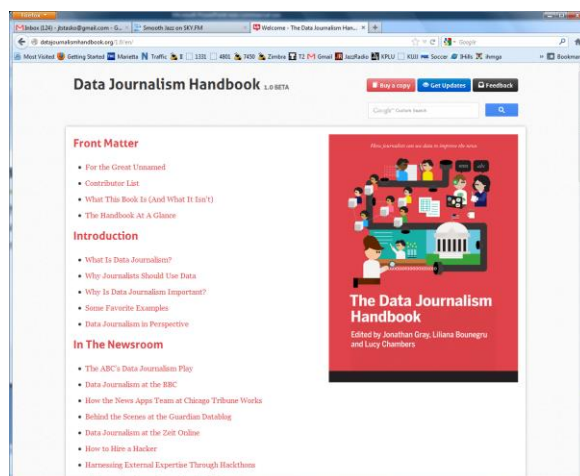


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Data Journalism Handbook



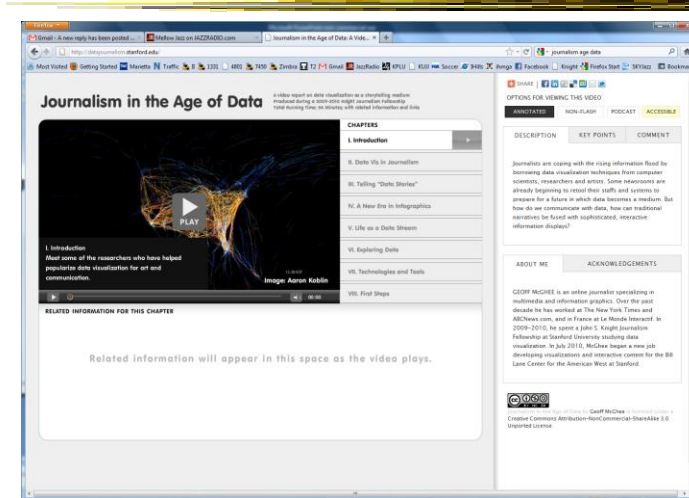
http://datajournalismhandbook.org/1.0/en/

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Journalism in the Age of Data



Video

<http://datajournalism.stanford.edu/>

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Some Examples



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News Stories

Tufte praises the work of Megan Jaegerman at NY Times



HOME BOOKS COURSES POSTERS AND SLIDES PAPER FIRE ART SCULPTURE
ET WRITINGS ARTWORKS NEWS DOGS & OTHERS OF GRAPHICS PRESS POWERSHO

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Megan Jaegerman's brilliant news graphics

Edward Tufte, July 2007

Megan Jaegerman produced some of the best news graphics ever while working at *The New York Times* from 1990 to 1998. Her work is smart, fluid, detailed, elegant, witty, sensitive, informative. A fierce researcher and reporter, she writes gracefully and precisely. Megan has the soul of a news reporter, who happens to use graphic tables, and illustrations — as well as words — to explain the news. Her best work is the best work in news graphics.

From Montauk to Cape May: The State of the Beaches

Spotting a hidden handgun

The Jumping Off Points: Moves That Will Be Made in the Freestyle Programs

THE CBSP: The International School

SHINY SPOTS TO WATCH

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http://www.edwardtufte.com/bboard/q-and-a-fetch-msg?msg_id=0002w4

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An Inconvenient Truth



1000 Years of CO₂ and Global Warming

Temperature (Northern Hemisphere)

CO₂ Concentrations

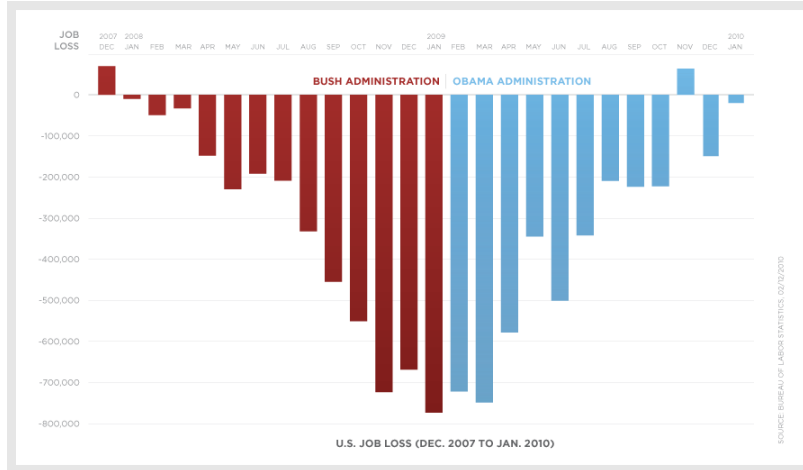
Gore made extensive use of data graphics

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Job Losses



Controversial, see <http://soquelbythecreek.blogspot.com/2010/02/what-does-obama-job-chart-really-mean.html>

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<http://www.nytimes.com/interactive/2010/06/29/magazine/rivera-pitches.html?ref=multimedia>

Mariano Rivera



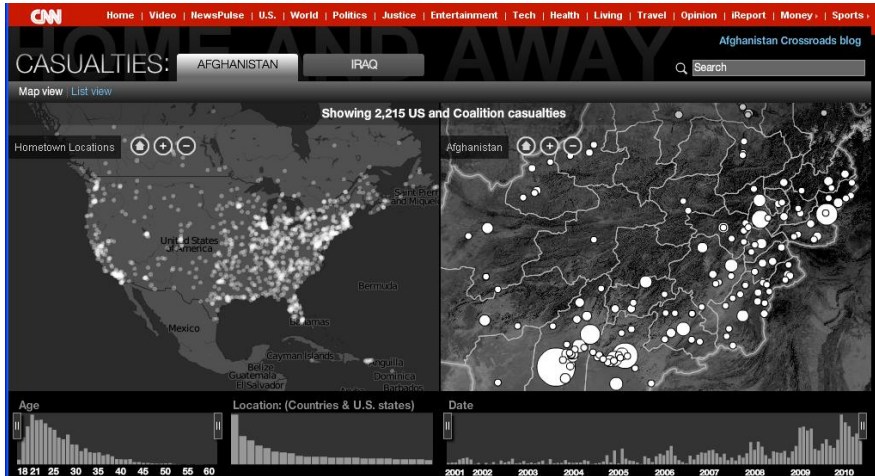
The screenshot shows the 'Magazine' section of The New York Times website. The main article is titled 'How Mariano Rivera Dominates Hitters' and is dated June 29, 2010. The article's sub-headline reads: 'The closer has confounded hitters with mostly one pitch: his signature cutter.' Below the text is a video player showing Rivera in a Yankees uniform throwing a ball. To the right of the article is an advertisement for the Audi A8, with the text 'The new Audi A8 is here. Luxury has progressed.' Below the advertisement is a 'Times Delivers E-Mail' sign-up box. At the bottom of the page, there is a 'MOST POPULAR - MAGAZINE' section with a list of five articles: 1. Food: Coffer's Slow Dance, 2. Shaken-Baby Syndrome Faces New Questions in Court, 3. Unhappy Meals, 4. Recipe: Yuzu Chiffon Cake, 5. The Medium: A Prescription for Fear, 6. How He Got His Groove Back, 7. A Plan for Peace That Still Could Be.

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Casualties of War



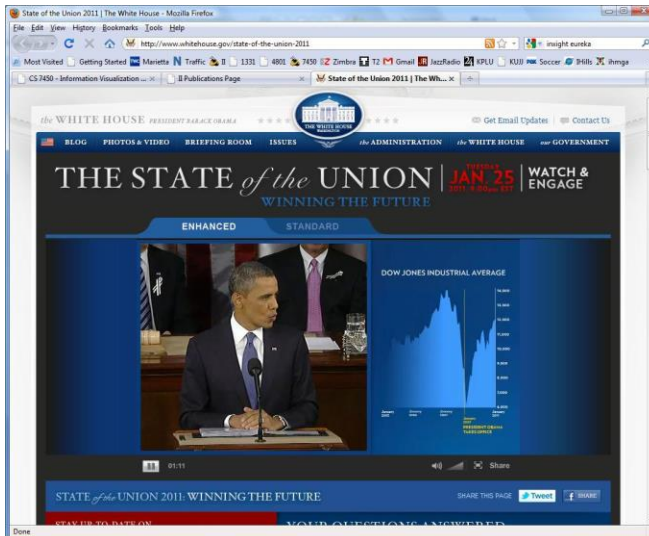
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The President Going Interactive

2011 State of Union Address

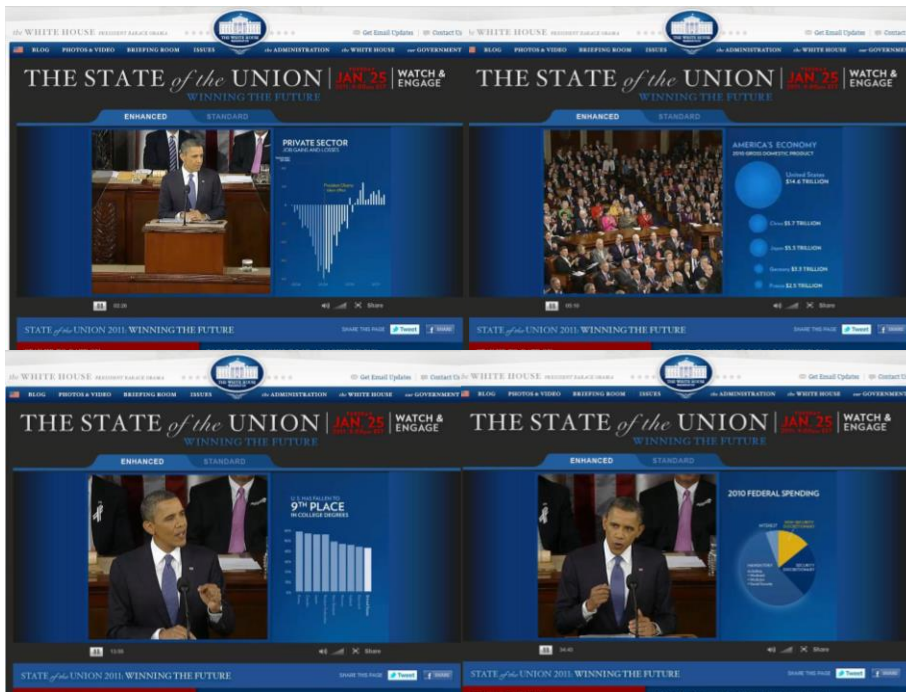


Side channel data visualizations accompanied speech

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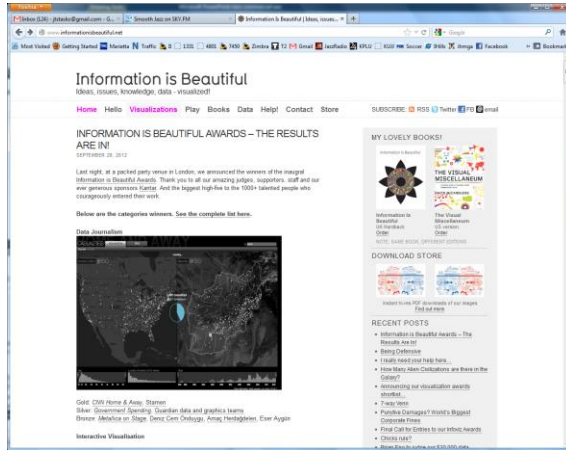
Data Matters



David McCandless

http://www.ted.com/talks/david_mccandless_the_beauty_of_data_visualization.html

McCandless Website



<http://www.informationisbeautiful.net/>

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More Visualization Stories



Aaron
Koblin

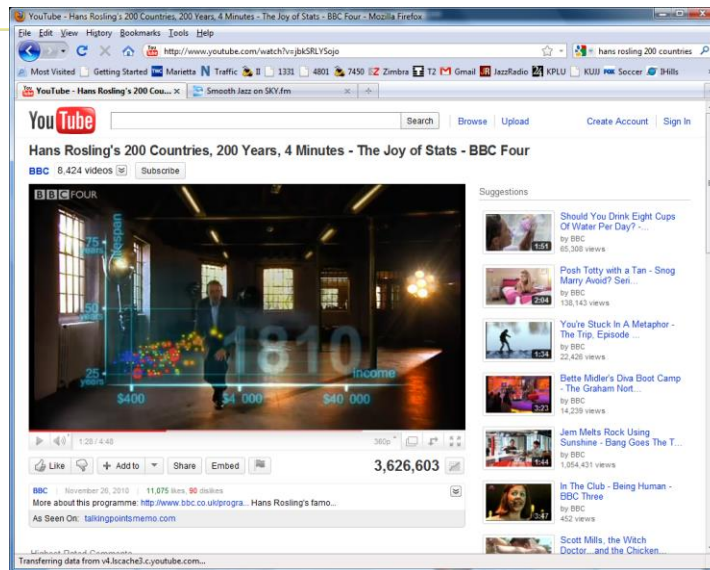
http://www.ted.com/talks/aaron_koblin.html

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Back to Where We Started



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Questions

- How do these types of visualizations differ from "traditional" infovis?

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Questions



- What is emphasized in “presentational” infovis versus “analytic” infovis?

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My Reflections



- InfoVis for analysis and presentation are different
 - Apples & oranges (both fruit though)
- How?

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HW 1 Discussion



- Some examples
- Thoughts

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Project



- More topic ideas
- Team formed?

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Upcoming



- Multivariate Data & Table/Graph Design
 - Reading:
Munzner chapter 2

- Few's Design Guidance
 - Reading:
Now You See It, chapters 5-12