

Creating Data Visualizations for Decision-Making - Resource List

David Christensen and Lindsay Hanson

Washington Library Association Conference 2017

Data at Work: Best practices for creating effective charts and information graphics in Microsoft Excel by Jorge Camoes

Creating a Data Driven Organization by Carl Anderson

Storytelling with Data: A data visualization guide for business professionals by Cole Nussbaumer Knaflic

Effective Data Visualization: The Right Chart for the Right Data by Stephanie Evergreen

The Functional Art by Alberto Ciaro

Good Charts by Scott Berinato

Now You See It by Stephen Few

Storytelling with Data blog - <http://www.storytellingwithdata.com/>

The Functional Art blog - <http://www.thefunctionalart.com/>

Junk Charts blog - <http://junkcharts.typepad.com/>

Data visualization lessons (for Tableau and Excel) on Lynda.com

Creating Data Visualizations for Decision-Making - Checklist

David Christensen and Lindsay Hanson

Washington Library Association Conference 2017

- Before you begin, know your data
- Anticipate important decision points that will use data
- Layout graphs on similar concepts in close proximity
- Use different colors sparingly and consistently
- Use larger size to highlight most important graph
- Both axes start at zero
- Color scheme is intentional and used to highlight specific details
- Title and subtitle are descriptive and explanatory
- Data are correctly labeled
- Data are labeled directly (not on a legend)
- Text is easily legible
- Labels are used sparingly
- Proportions are accurate
- All graphs have one horizontal and one vertical axis
- Both axes are labeled and clean looking
- Pie charts (if any) have no more than 3 categories
- Interactive visualizations anticipate audience questions
- Trend lines need more than two points
- Use of 3D is avoided
- Feedback from others incorporated (ideally person(s) closest to data and or potential data viz end users)

Creating Data Visualizations for Decision- Making



David Christensen, The Seattle Public Library
Lindsay Hanson, Sno-Isle Libraries

Creating Data Visualisations for Decision Makers

<our promise> As libraries become increasingly data-driven the need for useable data also expands. The process of translating raw data into actionable information is complicated and has many potential pitfalls. Learn how two large library systems are navigating this process to create and share visualizations to inform decisions. Attendees will learn best practices for the process of turning raw data into visualizations and how to tailor them for their intended audience. </our promise>

Points = prizes



Who are we?



Lindsay Hanson, Data Analysis Librarian Sno-Isle Libraries

- Facilitate the identification of metrics for evaluating the Strategic Plan
- Manage metrics and evaluation for Public Services
- Design surveys for Public Services
- Identify trends for research needs and new projects
- Provide analyses and visualizations for service managers

At Sno-Isle Libraries

Who:

- Lindsay provides visualizations and analyses for public services projects and managers and manages operational reports for the organization
- Additional reporting done by ILS manager and IT Network Engineer as needed

Tools / Resources:

- Tableau Desktop (4 users)
- Tableau Reader (all staff workstations)
- Tableau Online
- SQL Data Warehouse
- Analytics on Demand

Who are we?



David Christensen, Librarian

The Seattle Public Library

- Data Analysis Lead
- Identify trends for research needs and new projects
- Provide analyses and visualizations for mid-level managers and leadership team
- Open Data liaison with to City of Seattle

At The Seattle Public Library

Who:

- David makes visualizations for special projects and leadership team decisions.
- Levy Administrator (Levy reporting)
- (2) Business Analysts (Financial Reporting)
- IT staff (Data Warehouse, SQL Reports)

Tools / Resources:

- Tableau Desktop (5 users)
- Tableau Reader (many staff workstations)
- SQL Reports (all staff can access)
- Microsoft SQL Data Warehouse
- R (RStudio)
- QGIS

What is “Data Visualization for Decision-Making”?



- Inform a one-time or repeat decisions
- Can explore organizational efficiency, leading to policy innovation
- Not necessarily infographics intended for public consumption

Data visualization is a way to communicate findings as clearly and succinctly as possible. It leverages our visual memory rather than focusing on text.

Our Examples

Best Practices

Start With Good Data (in 4 steps)

1. Anticipate future reporting needs
2. Think longitudinally (gather data that can be compared over time)
3. Work with other data owners (IT, Systems Librarian, etc)
4. Make a data dictionary! (define your data)

(Garbage data will yield garbage results.)

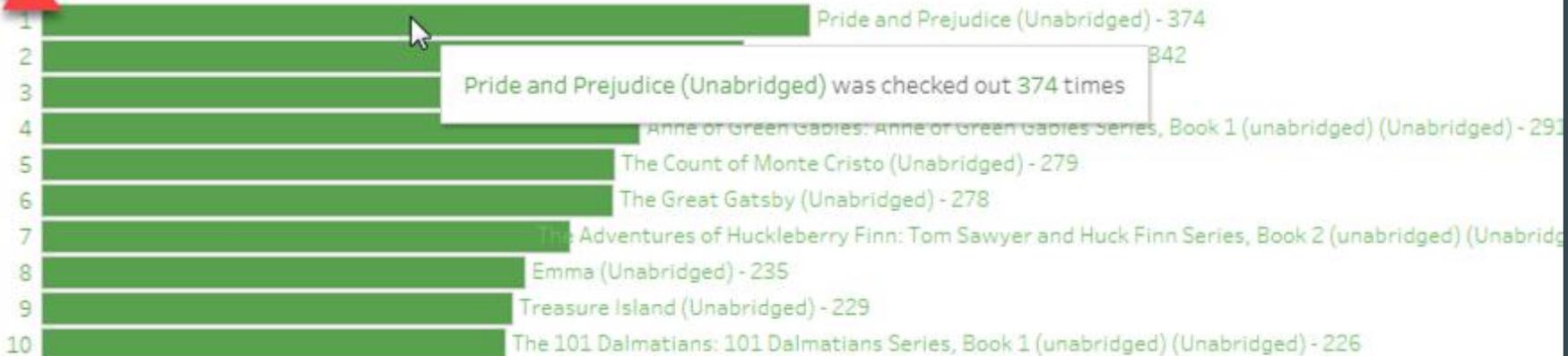
Know your data!

- How was the data collected?
- What is missing from the data?
- What columns are present in your data?
- Talk to the domain expert

What does it mean to not know your data ?

Seattle Public Library Audiobook Checkouts, Sept 2005 - Feb 2017

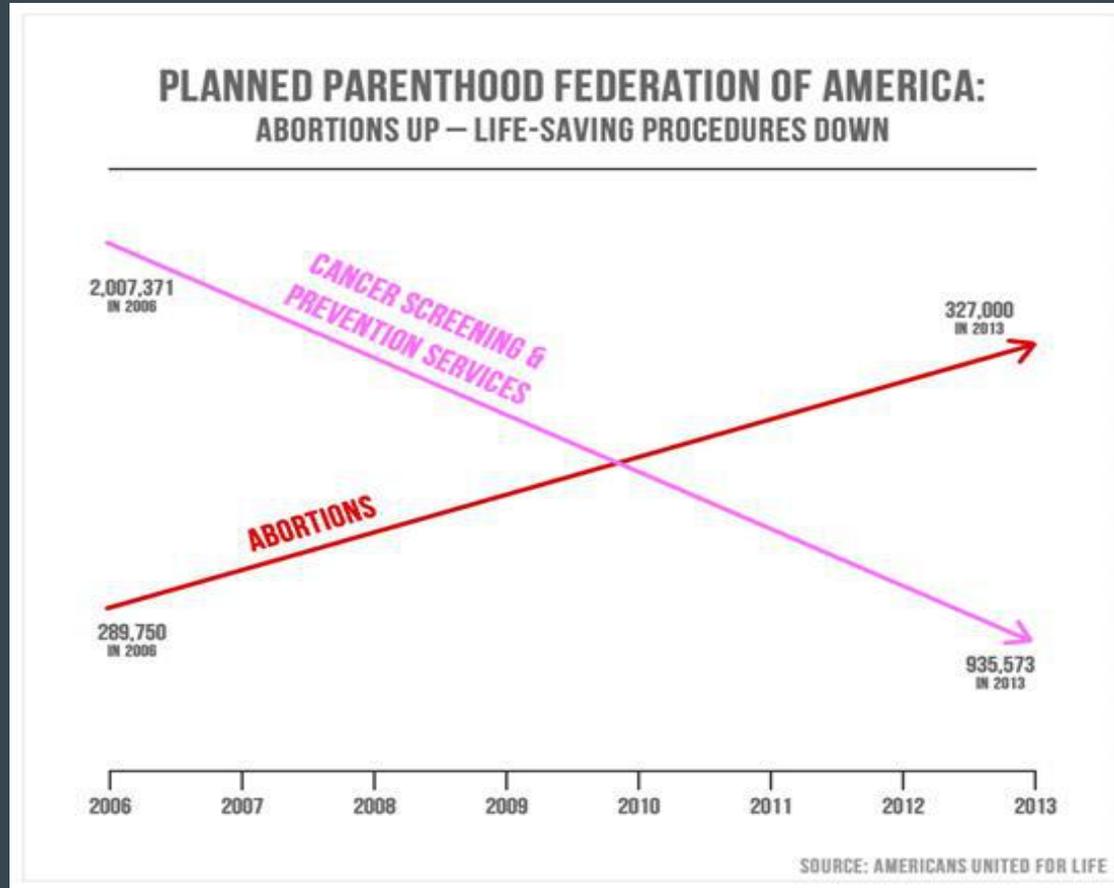
138 months, 54,460 unique titles, 1,020,805 total checkouts



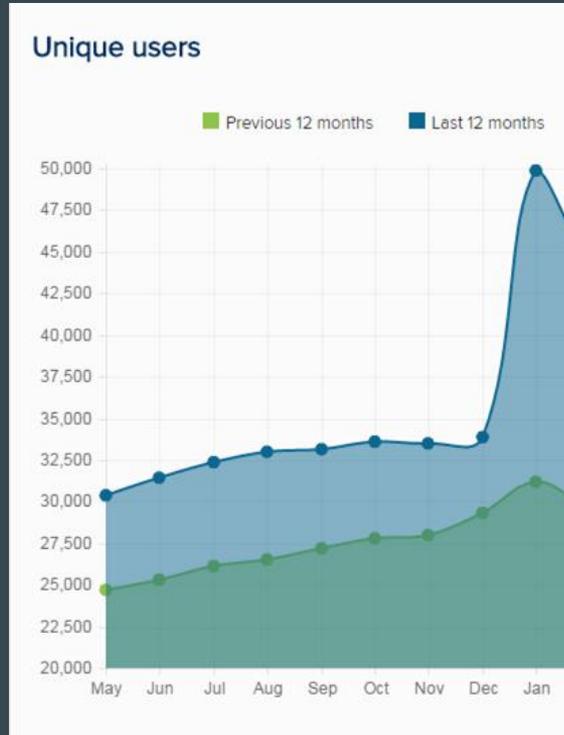
Domain knowledge can help identify data issues.



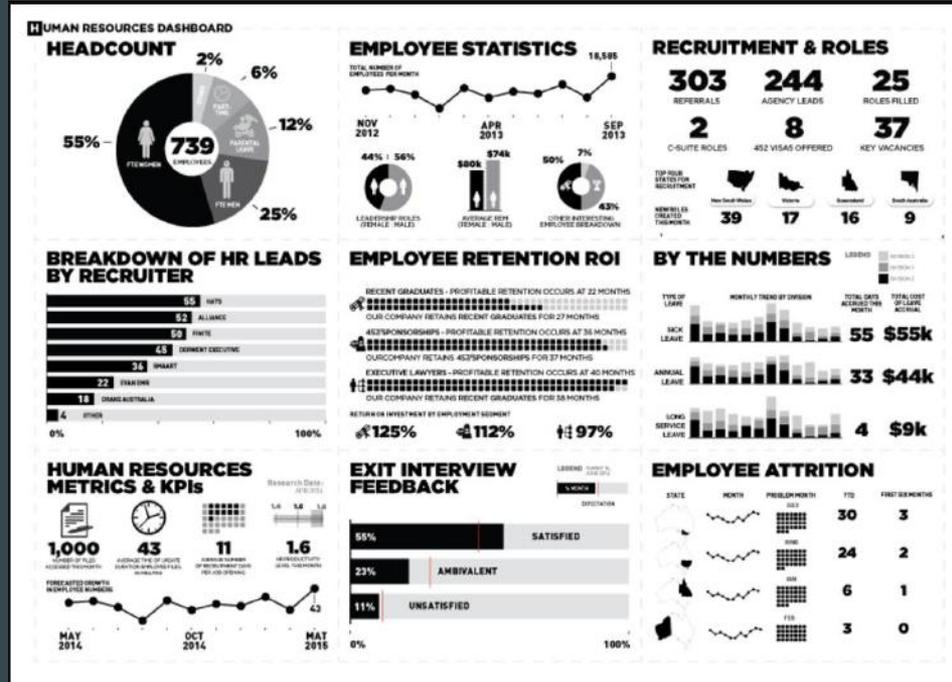
With data viz powers comes great responsibility!



Provide context for the unexpected

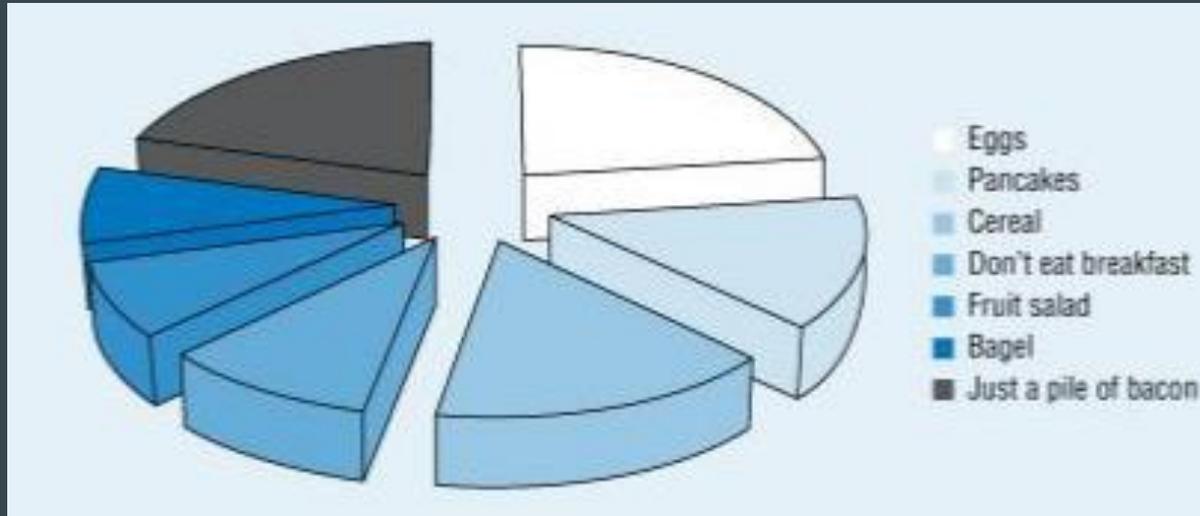


Pass the Print Test



<https://i.pinimg.com/originals/5b/dd/08/5bdd083ceb9c874c8dd2cb23c9307515.png>

Avoid 3D Pie Charts



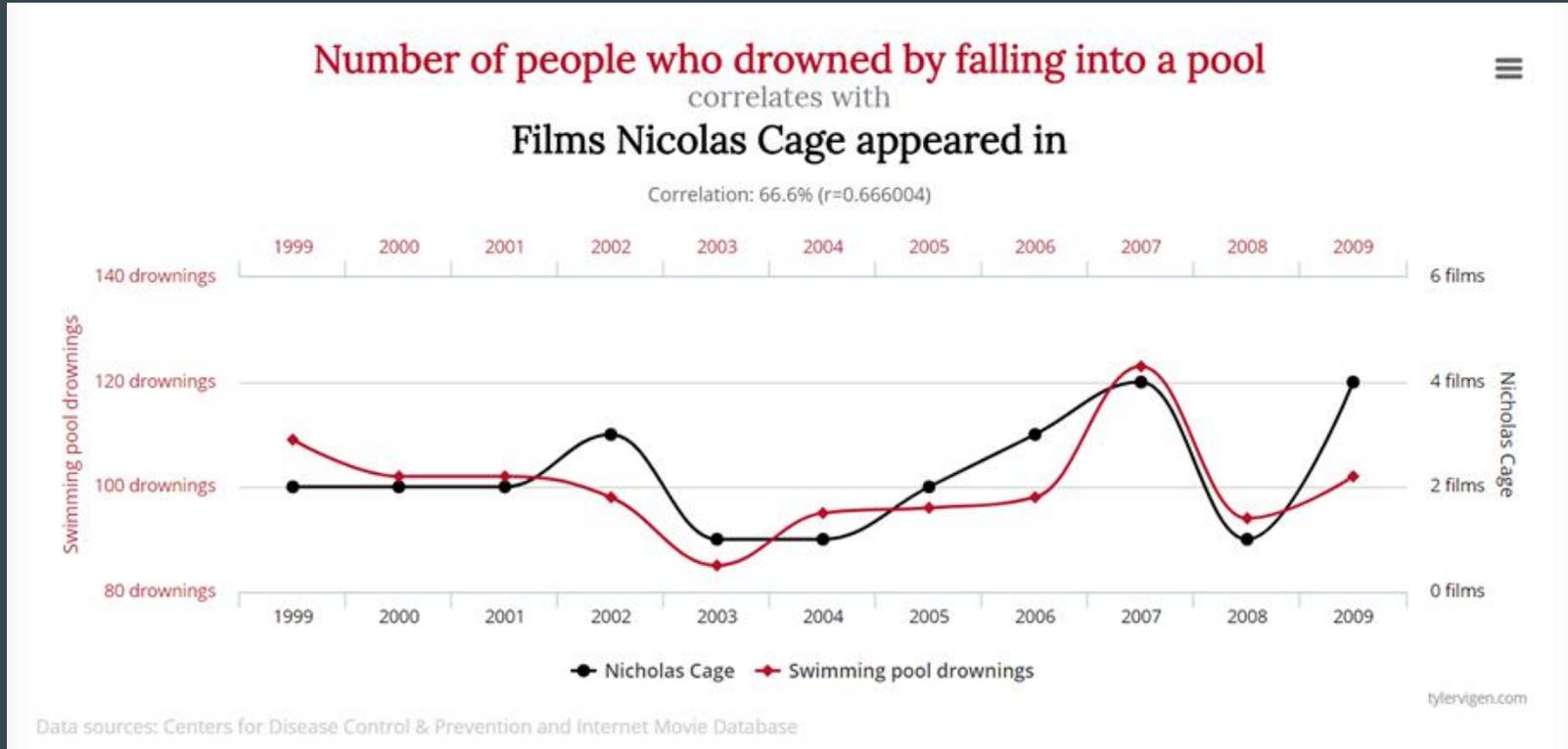
Don't confuse Causation and Correlation



=



Don't confuse Causation and Correlation



Anticipate Decision Points

Total Personalized Lists

June 2011 through March 2017

8,570

Top 3 months

Average requests by month

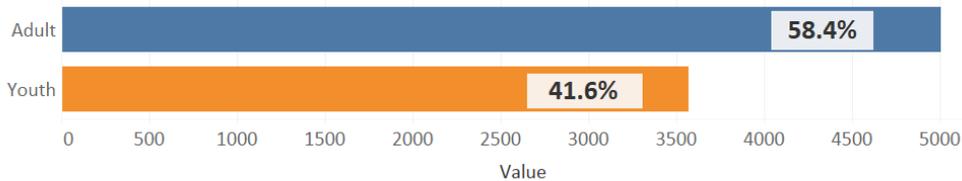
July	161.0
June	154.5
September	149.2

Total Books Suggestions

Estimate from 5 book suggestions per list

42,850

YN5 Requests by age



50+ Requests per month

Count of consecutive months with more than 50 requests.

70

Requests Per Month

June 2011 through March 2017

122.4

Requests Per Month

last 12 months

131.8

Which months might need more staffing?

Which type of librarians should we schedule to staff a service?

How do I know given library service is still popular?

Lessons Learned

- Always ask - “What decision are you trying to make?”
- Decision-making is more challenging without organizational metrics
- Data “owners”/domain experts need to inform visualization

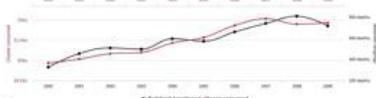
Activity

Step 1: Find 3 issues with each visualizations on handout

Name: _____
Library: _____

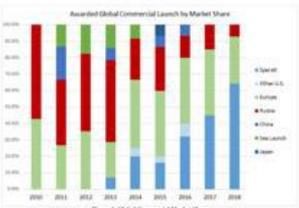
Points mean Prizes!!

Per capita cheese consumption
Number of people who died by becoming tangled in their bedsheets



1.
2.
3.

Assembled Global Commercial Lenses by Market Share



1.
2.
3.

Creating Data Visualizations for Decision Makers | November 2, 2017
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Complex dashboard with multiple charts:



1.
2.
3.

1. After attending this session, I learned 1 or more best practices of data visualization:
 Yes
 No

2. Tell us your level of agreement with this statement: "I intend to use a skill I learned in this session at work."
 Strongly disagree
 Disagree
 Neither agree, nor disagree
 Agree
 Strongly agree

3. I would like to see a future workshop about...

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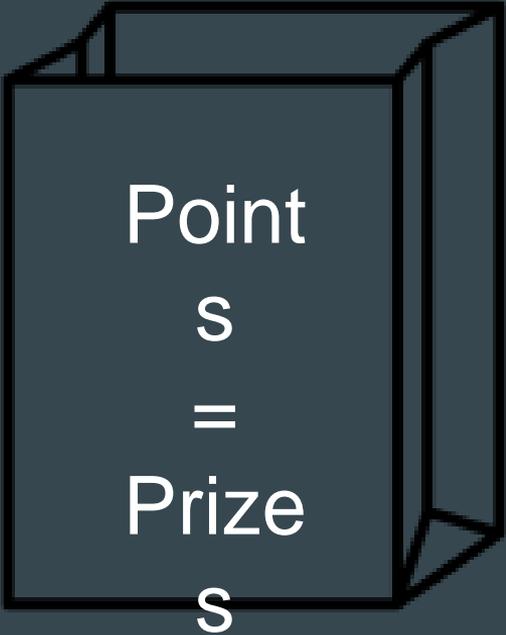
Step 2: Cut and fold

Name: _____

Library: _____



Step 3: Drop slip envelop drawing bag



Resources

