



5 important elements of dashboard design

Jason Harmer, MBS
Performance Analysis Consultant, TELUS
Tableau Desktop Certified Professional



Introduction



Jason Harmer

Performance Analysis Consultant, TELUS

- Grew up in Minnesota, spent adult life in Iowa, now in Calgary, AB
- Over 10 years in the BI / data viz space
- Lead various data groups while in Iowa (Tableau User Group, DAMA Iowa)
- Tableau Desktop Certified Professional
- Master of Business Analytics (Iowa State), 2018

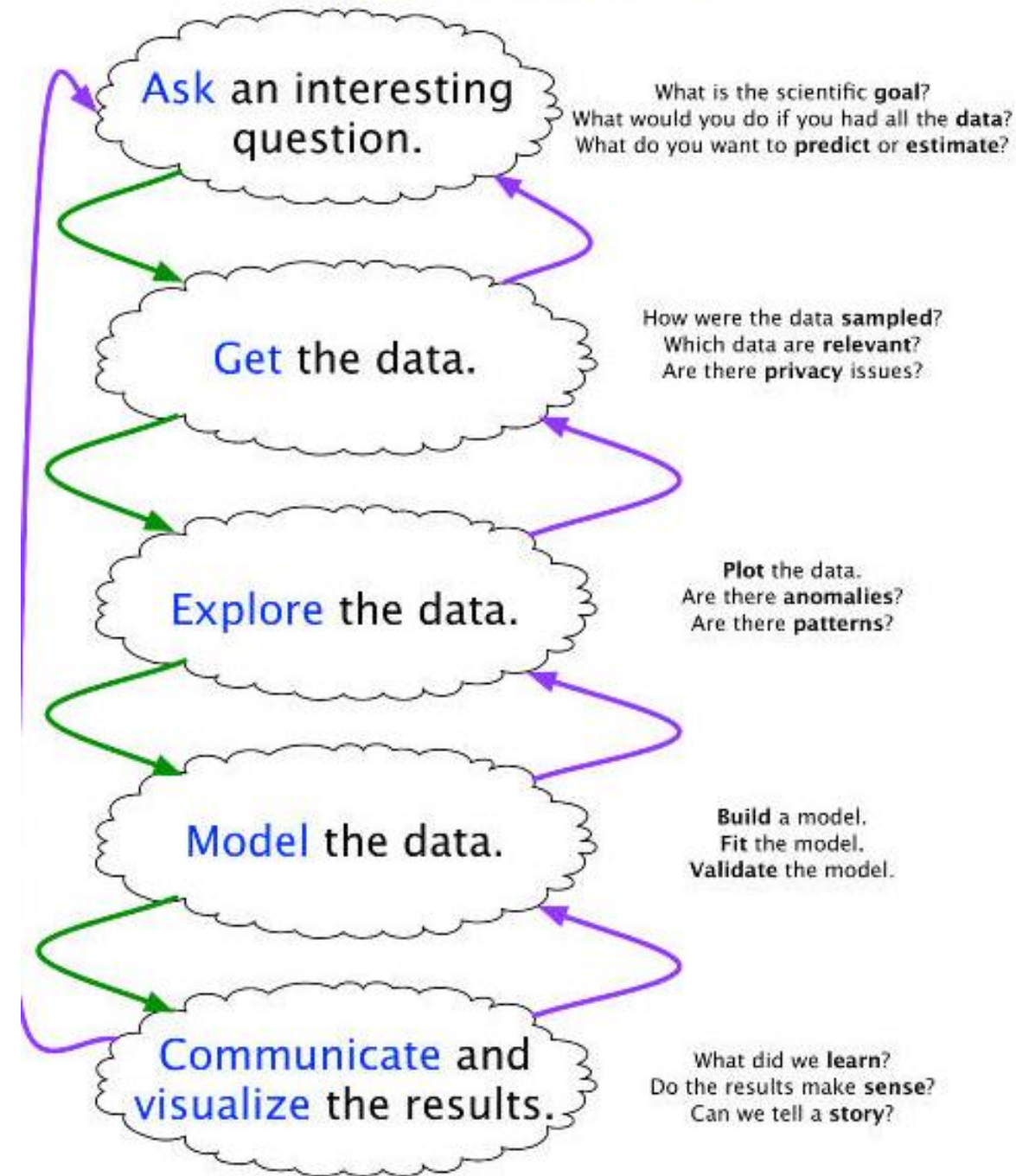
Contents

- Why (good) data visualization is important
- Historical dashboard design “rules”
- Five elements of dashboard design
- Wrap up / Q & A

Why (good) data visualization is important



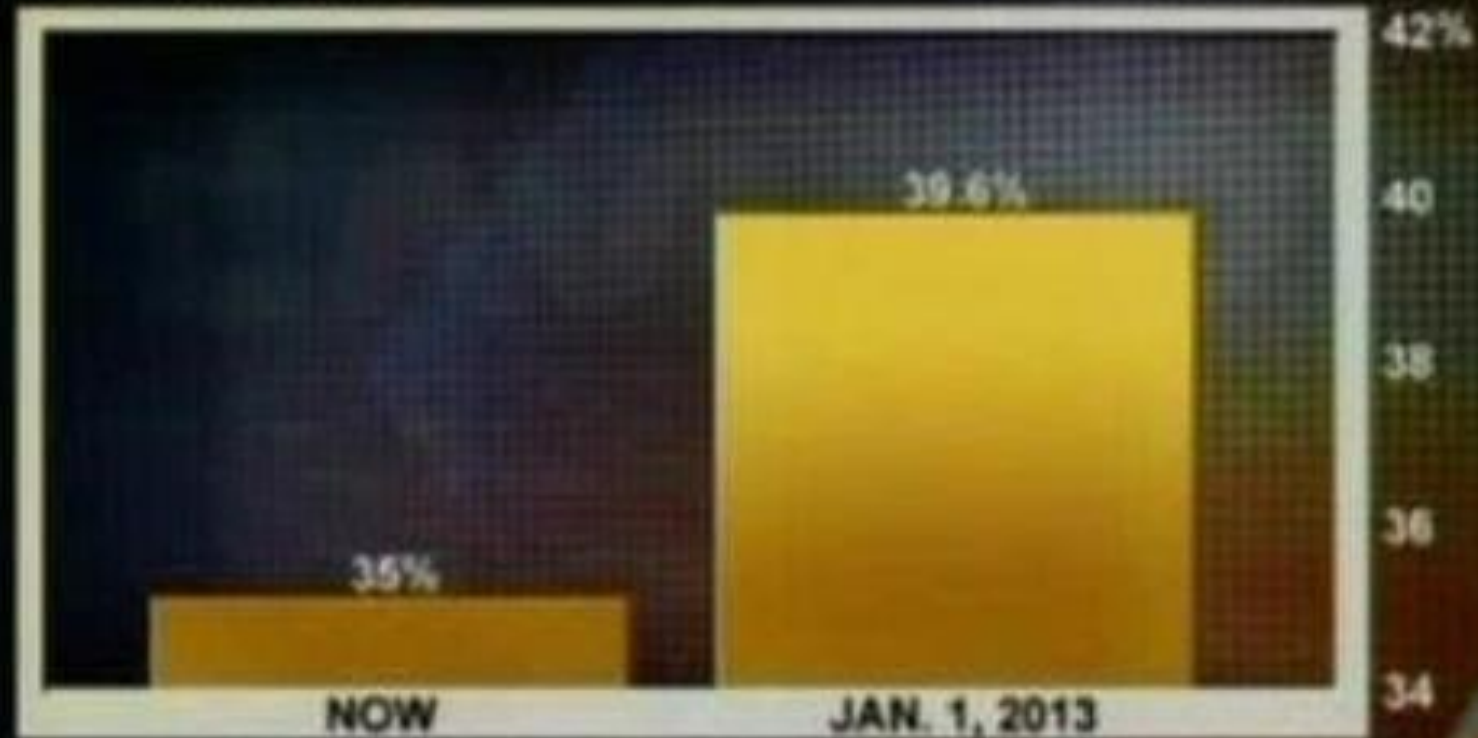
The Data Science Process



Joe Blitzstein and Hanspeter Pfister, created for the Harvard data science course <http://cs109.org/>.

IF BUSH TAX CUTS EXPIRE

TOP TAX RATE



8:01 p. ET

TOP STORIES

TECHNOLOGY

CONSUMER

WITH THE JUSTICE DEPARTMENT AND ACQUIRES FULL T

DOW 13008.68 ∇ 64.33

S&P 1379.32 ∇ 5.98

NASDAQ 2939.52 ∇ 6.32

JOB LOSS BY QUARTER



SOURCE: BLS

VIEWER VOTE

COM

HOW CONCERNED ARE YOU ABOUT THE ZIKA VIRUS?



2012 PRESIDENTIAL RUN

GOP CANDIDATES



SOURCE: OPINIONS

DYNAMIC

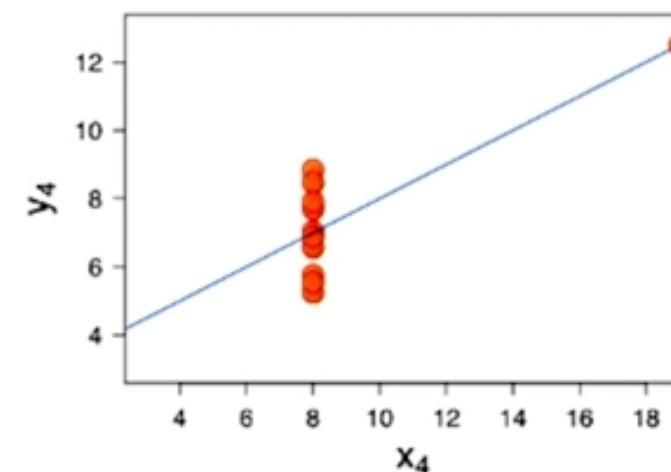
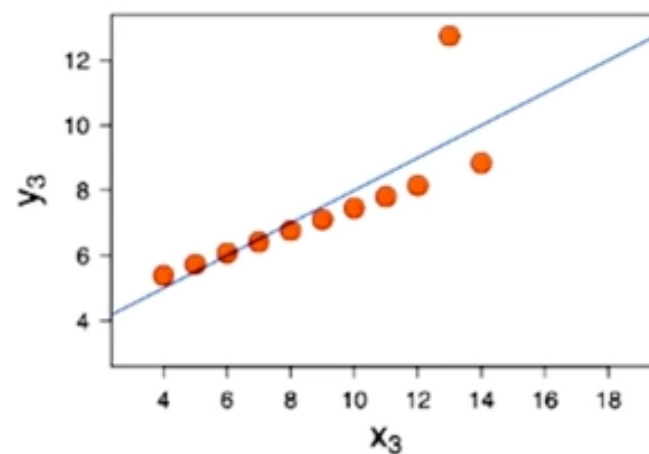
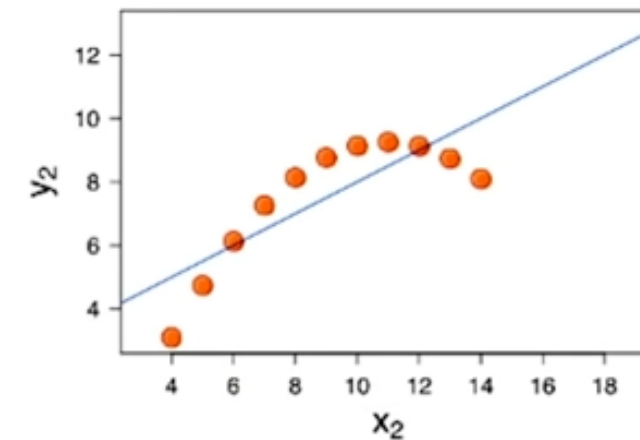
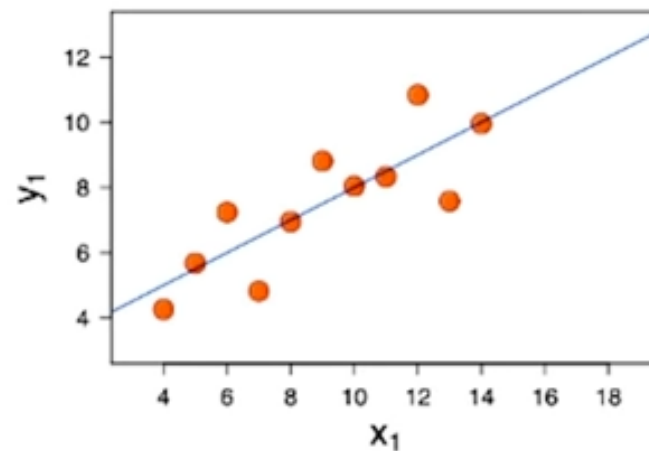
Impact

- Confusion
- Bias
- Misinformation

>>>>> *Leads to bad, uninformed, slow decision making*

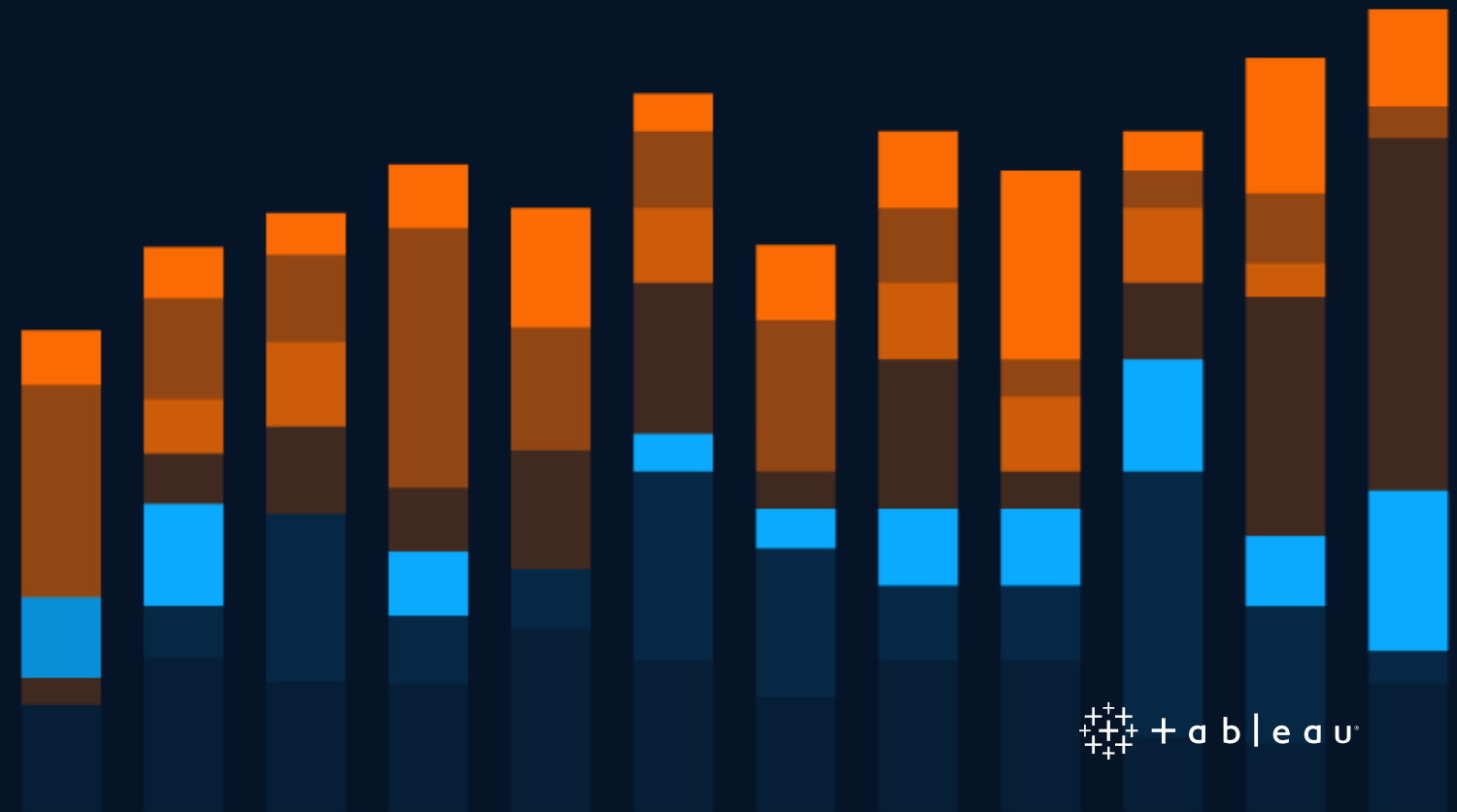
Anscombe's Quartet

I		II		III		IV	
x	y	x	y	x	y	x	y
10.0	8.04	10.0	9.14	10.0	7.46	8.0	6.58
8.0	6.95	8.0	8.14	8.0	6.77	8.0	5.76
13.0	7.58	13.0	8.74	13.0	12.74	8.0	7.71
9.0	8.81	9.0	8.77	9.0	7.11	8.0	8.84
11.0	8.33	11.0	9.26	11.0	7.81	8.0	8.47
14.0	9.96	14.0	8.10	14.0	8.84	8.0	7.04
6.0	7.24	6.0	6.13	6.0	6.08	8.0	5.25
4.0	4.26	4.0	3.10	4.0	5.39	19.0	12.50
12.0	10.84	12.0	9.13	12.0	8.15	8.0	5.56
7.0	4.82	7.0	7.26	7.0	6.42	8.0	7.91
5.0	5.68	5.0	4.74	5.0	5.73	8.0	6.89



- Mean x , mean y , var x , var y , regression, R and R -square approx. the same for all 4 data sets

“Rules” of Dashboard Design



Historical Rules

Profit by Region and Category				
	North	South	East	West
Accessories	\$7,251.63	\$11,195.86	\$7,004.54	\$16,484.60
Appliances	-\$2,638.62	\$8,391.41	\$4,123.94	\$8,261.27
Art	\$1,195.16	\$1,899.94	\$1,058.59	\$2,374.10
Binders	-\$1,043.64	\$11,267.93	\$3,900.66	\$16,096.80
Bookcases	-\$1,997.90	-\$1,167.63	\$1,339.49	-\$1,646.51
Chairs	\$6,592.72	\$9,357.77	\$6,612.09	\$4,027.58
Copiers	\$15,608.84	\$17,022.84	\$3,658.91	\$19,327.24
Envelopes	\$1,777.53	\$1,812.41	\$1,465.48	\$1,908.76
Fasteners	\$236.62	\$263.99	\$173.72	\$275.19
Furnishings	-\$3,906.22	\$5,881.41	\$3,442.68	\$7,641.27
Labels	\$1,073.08	\$1,129.28	\$1,040.77	\$2,303.12
Machines	-\$1,486.07	\$6,928.64	-\$1,438.89	-\$618.93
Paper	\$6,971.90	\$9,015.37	\$5,947.06	\$12,119.24
Phones	\$12,323.03	\$12,314.69	\$10,767.28	\$9,110.74
Storage	\$1,969.84	\$8,389.37	\$2,274.30	\$8,645.32
Supplies	-\$661.89	-\$1,155.14	\$1.88	\$626.05
Tables	-\$3,559.65	-\$11,025.38	-\$4,623.06	\$1,482.61
Total by Region	\$39,706.36	\$91,522.78	\$46,749.43	\$108,418.45

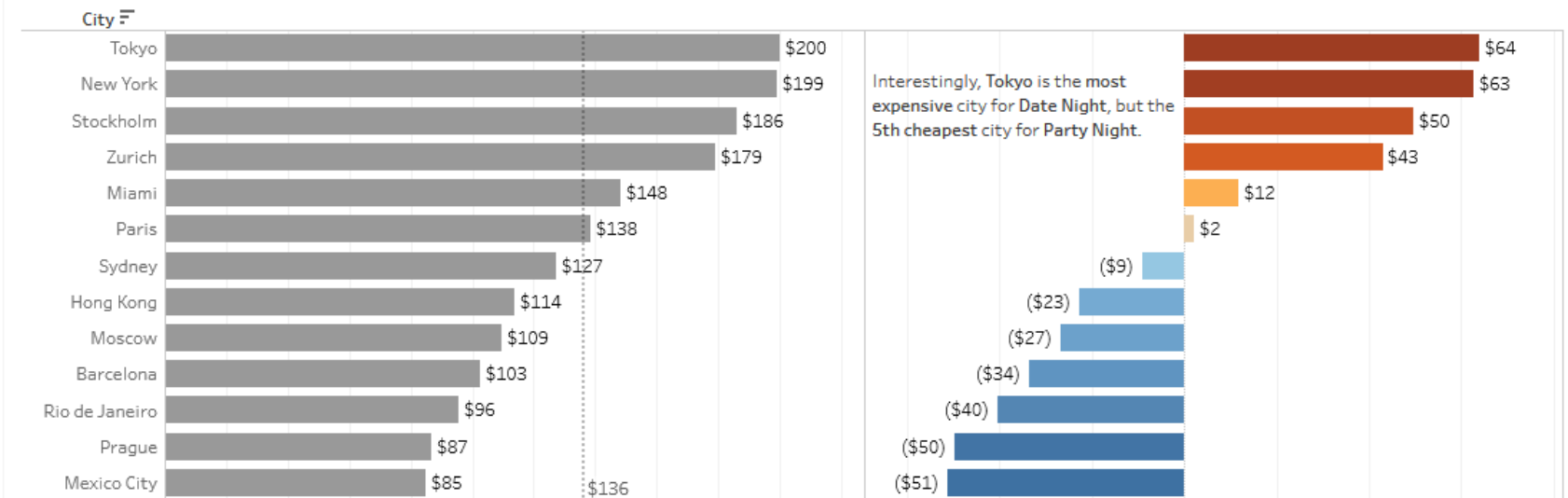
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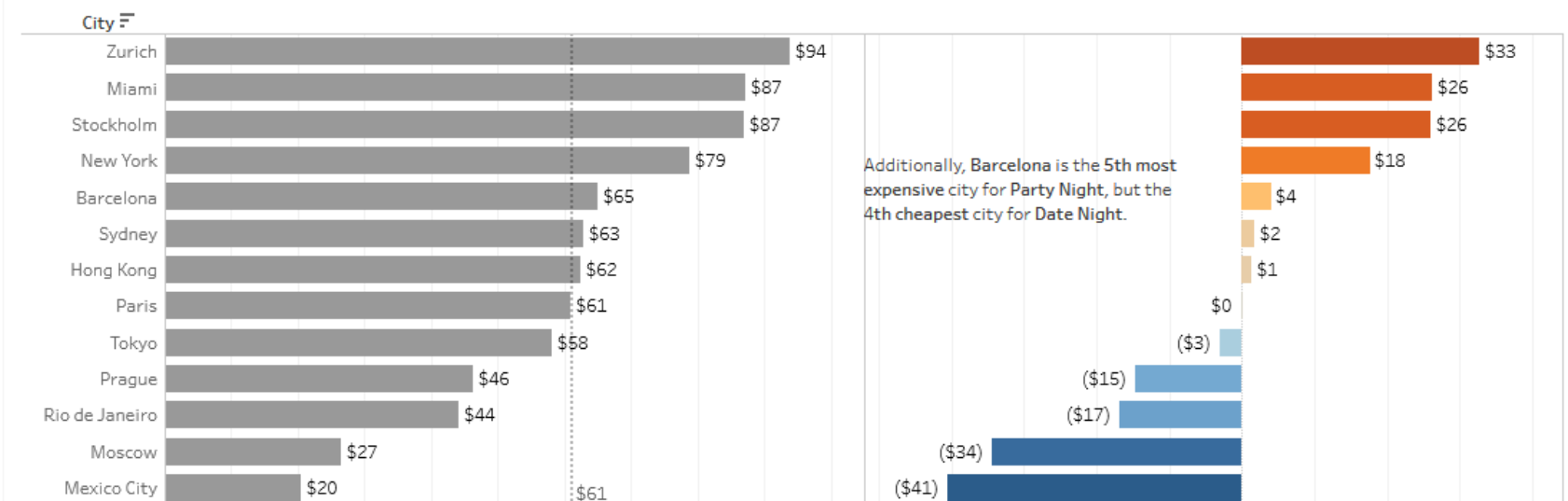
- Stephen Few, Edward Tufte
- Rules outdated or too academic
- Chart Junk
- Data / Ink Ratio
- Colors

How Expensive (or Cheap) is it to Party or Go on a Date?

Avg Cost by City and Difference from Overall Average - Date Night



Avg Cost by City and Difference from Overall Average - Party Night

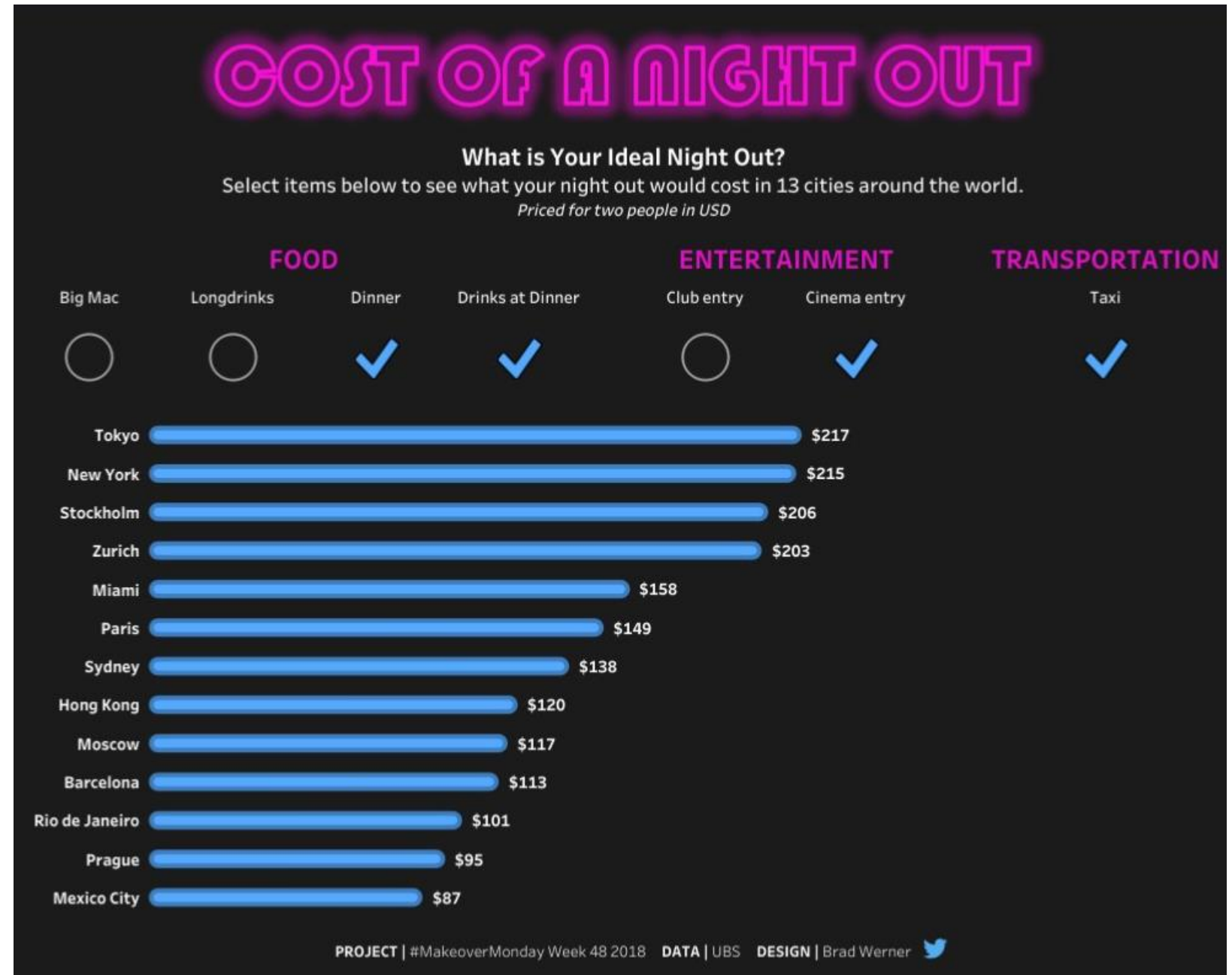


Data source: <https://www.statista.com/chart/14081/the-price-of-a-party-around-the-world/>

Created by Jason Harmer

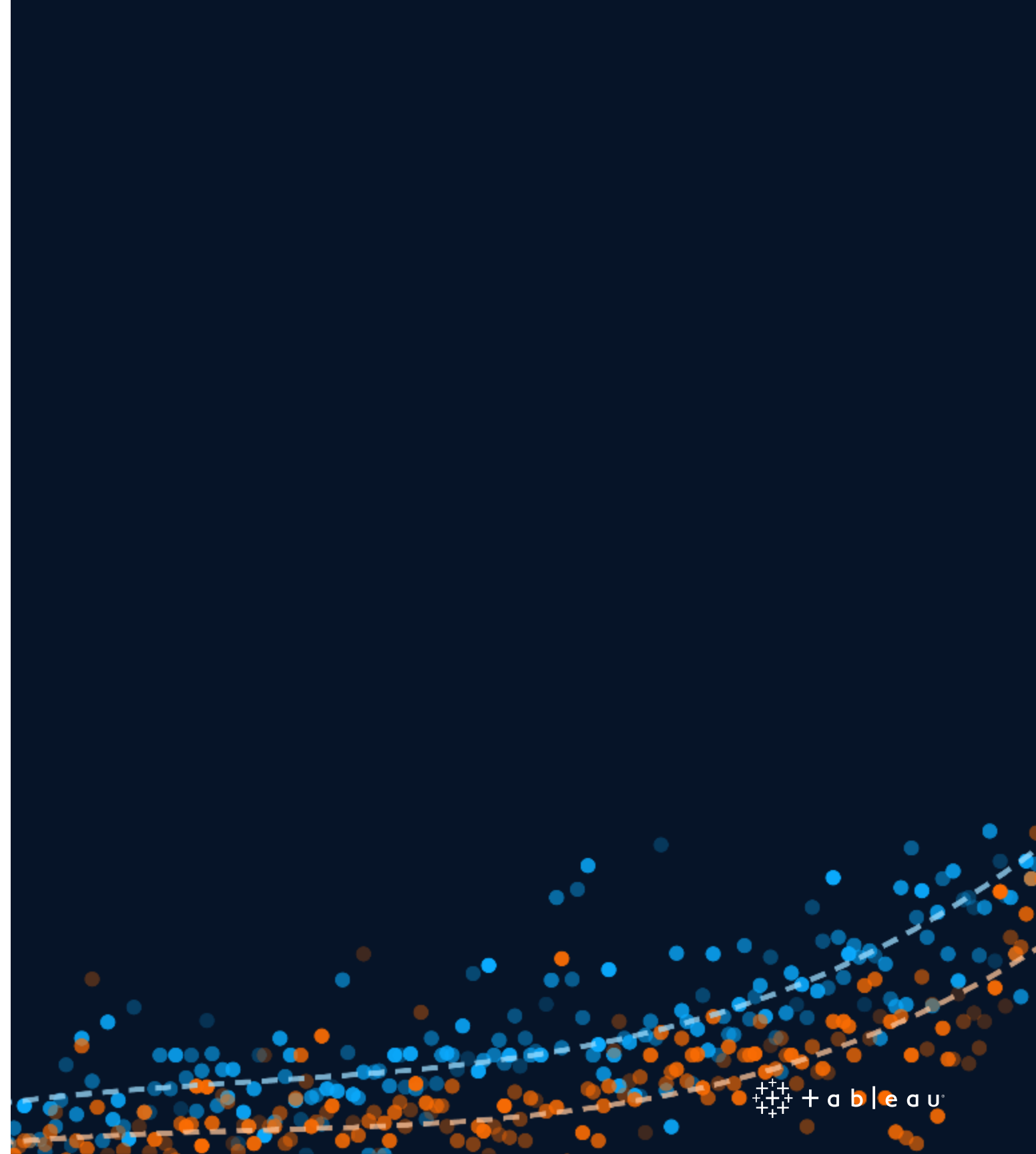
Same data, different result

- If a perfectly designed dashboard has zero engagement, is that truly a perfect design?



Credit: Brad Werner (@Brad_Werner)

5 important elements of dashboard design



5 important elements of dashboard design

- Created by a team in Seattle – Decisive Data
- Book is available – leverages Tableau but topic is tool agnostic
- End result is more accessible data and increased speed to insights

Integrity, Flow, Color, Typeface, Charm

Integrity



- .287 Batting Avg
- 22 Seasons
- 9801 At Bats

VS



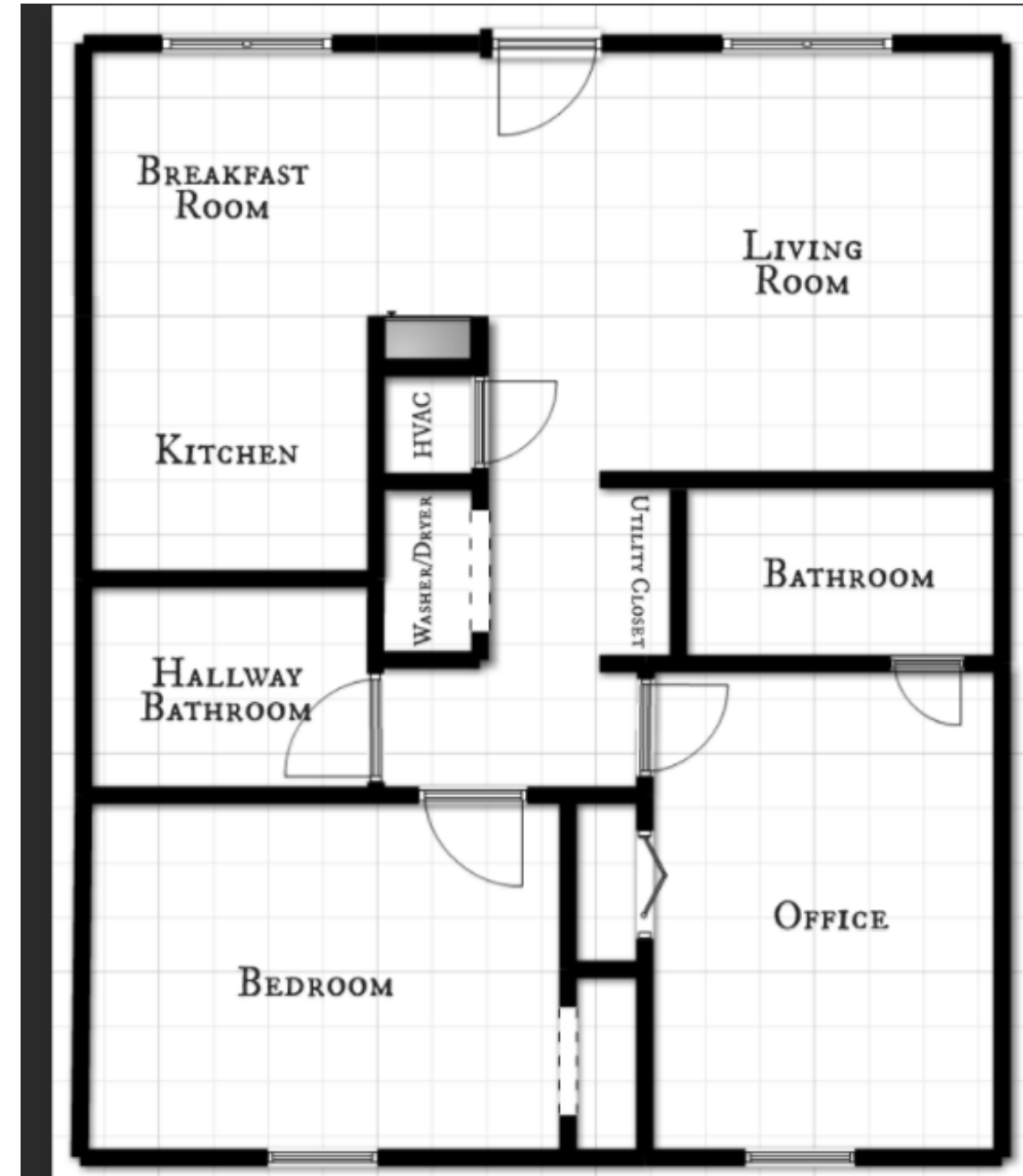
- 1.00 Batting Avg
- 1 Season
- 1 At Bat

Integrity

- Removes bias / preconceptions
- Uses a variety of metrics
- Appropriate aggregations
- Compares data in meaningful ways
- Frames the data with context

Flow

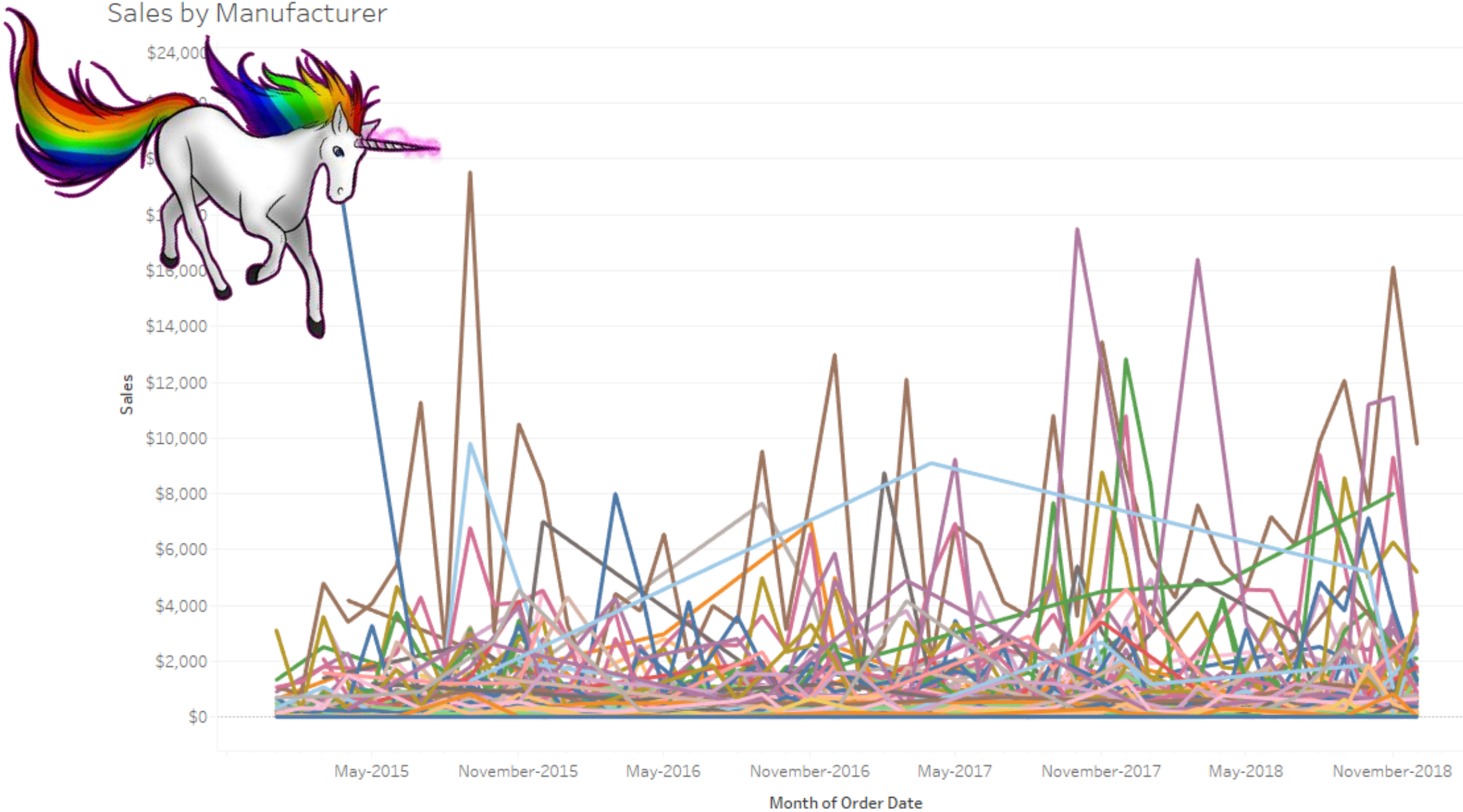
- Visual clues
- Visual momentum
- Offers relevant information in a meaningful sequence



Color



Color



Color

Overall Availability												YTD %	
Jan 18	Feb 18	Mar 18	Apr 18	May 18	Jun 18	Jul 18	Aug 18	Sep 18	Oct 18	Nov 18	Dec 18	Weekday	Weekend
99.73%	99.67%	99.39%	96.89%	97.83%	99.54%	99.57%	99.20%	99.35%	99.50%	99.10%	99.35%	98.84%	99.74%
99.73%	100.00%	99.61%	97.06%	97.83%	99.54%	99.57%	99.20%	100.00%	99.62%	99.13%	99.35%	98.97%	99.83%
97.41%	99.77%	100.00%	100.00%	100.00%	96.95%	100.00%	99.35%	100.00%	100.00%	100.00%	100.00%	99.27%	100.00%
100.00%	99.60%	99.30%	99.46%	100.00%	99.87%	99.69%	99.34%	100.00%	100.00%	99.02%	97.83%	99.35%	99.91%
100.00%	100.00%	100.00%	99.57%	99.19%	99.60%	99.56%	100.00%	99.46%	96.28%	99.46%	99.87%	99.39%	99.47%
100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.46%	100.00%	100.00%	100.00%	99.92%	100.00%
100.00%	100.00%	100.00%	99.50%	100.00%	99.94%	100.00%	99.51%	99.46%	100.00%	100.00%	100.00%	99.82%	100.00%
96.42%	100.00%	99.30%	99.01%	100.00%	100.00%	99.84%	100.00%	100.00%	100.00%	100.00%	97.38%	99.08%	99.87%
97.41%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.46%	100.00%	98.37%	99.22%	100.00%
97.07%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.46%	100.00%	100.00%	99.37%	100.00%
97.41%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.76%	100.00%	100.00%	99.44%	100.00%
100.00%	98.23%	99.70%	99.19%	99.62%	99.65%	100.00%	99.69%	99.77%	97.95%	99.51%	75.76%	97.41%	97.35%
99.63%	99.83%	99.41%	98.10%	99.75%	98.94%	99.83%	99.51%	98.69%	99.10%	94.19%	98.30%	98.43%	99.68%
100.00%	100.00%	100.00%	99.48%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.87%	99.86%	99.87%
99.35%	99.67%	99.39%	97.06%	97.83%	99.37%	99.57%	99.20%	99.35%	99.95%	99.10%	98.60%	98.76%	99.74%
100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.82%	100.00%	100.00%	98.21%	100.00%	100.00%	99.83%	
100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
99.83%	99.80%	99.62%	99.68%	100.00%	99.89%	100.00%	100.00%	99.83%	100.00%	100.00%	100.00%	99.90%	99.86%
99.35%	100.00%	99.39%	97.06%	97.83%	99.54%	99.57%	99.20%	99.35%	99.95%	99.10%	99.35%	98.86%	99.83%
100.00%	99.67%	99.39%	96.89%	97.83%	99.54%	99.57%	99.20%	99.30%	99.62%	99.70%	99.35%	98.95%	99.74%
99.65%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.56%	96.46%	98.80%	99.46%	97.66%	99.07%	99.63%
100.00%	100.00%	100.00%	99.62%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.98%	99.93%
100.00%	100.00%	100.00%	97.51%	97.83%	99.54%	99.57%	99.20%	100.00%	99.95%	99.10%	99.35%	99.09%	99.83%
100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.39%	99.81%	100.00%
99.73%	99.67%	99.39%	96.89%	97.83%	99.41%	99.57%	99.20%	99.35%	99.62%	99.10%	98.60%	98.76%	99.74%
100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Color

- Deliberate, consistent, meaningful
- Hue, shade, tint
 - Distinctive colors – call to action
 - Neutral colors – provide context
- Contrast / brightness – lead to disengagement
- Less is more



Color

	Janu..	Febr..	Marc..	April..	May..	June..	July..	Augu..	Sept..	Octo..	Nove..	Dece..
Accessories	\$436	\$127	\$473	\$342	\$855	\$487	\$342	\$598	\$1,645	\$917	\$1,972	\$1,469
Appliances	\$6	-\$39	\$530	-\$16	\$285	\$253	\$604	\$478	\$137	\$1,049	\$724	\$1,290
Art	\$34	\$79	\$57	\$199	\$132	\$34	\$117	\$104	\$186	\$118	\$256	\$97
Binders	\$668	\$169	\$296	-\$1,920	\$136	\$141	-\$879	\$172	\$943	\$2,290	\$1,028	\$7,170
Chairs	\$10	\$299	\$56	\$1,009	\$655	-\$63	\$408	-\$149	\$656	\$494	\$369	\$2,019
Envelopes	\$103	\$118	\$230	\$83	\$58	\$52	\$230	\$153	\$301	\$70	\$368	\$301
Fasteners	\$0	\$29	-\$1	\$36	\$4	\$14	\$41	\$12	\$27	\$33	\$62	\$36
Furnishings	\$211	\$65	\$406	\$38	\$618	-\$296	-\$22	\$144	\$615	\$122	\$599	\$1,434
Labels	\$44	\$15	\$4	\$16	\$85	\$163	\$83	\$130	\$144	\$61	\$349	\$101
Paper	\$237	\$568	\$415	\$506	\$1,200	\$1,207	\$629	\$470	\$1,120	\$667	\$1,018	\$1,035
Phones	\$361	\$370	\$464	\$631	\$1,062	\$1,020	\$771	\$231	\$787	\$674	\$1,574	\$1,514
Storage	\$512	\$384	\$113	\$151	\$443	\$560	\$250	\$128	\$828	\$369	\$894	\$1,574
Tables	-\$303	-\$40	-\$473	-\$797	\$551	-\$48	\$356	-\$378	-\$267	-\$875	-\$164	-\$513

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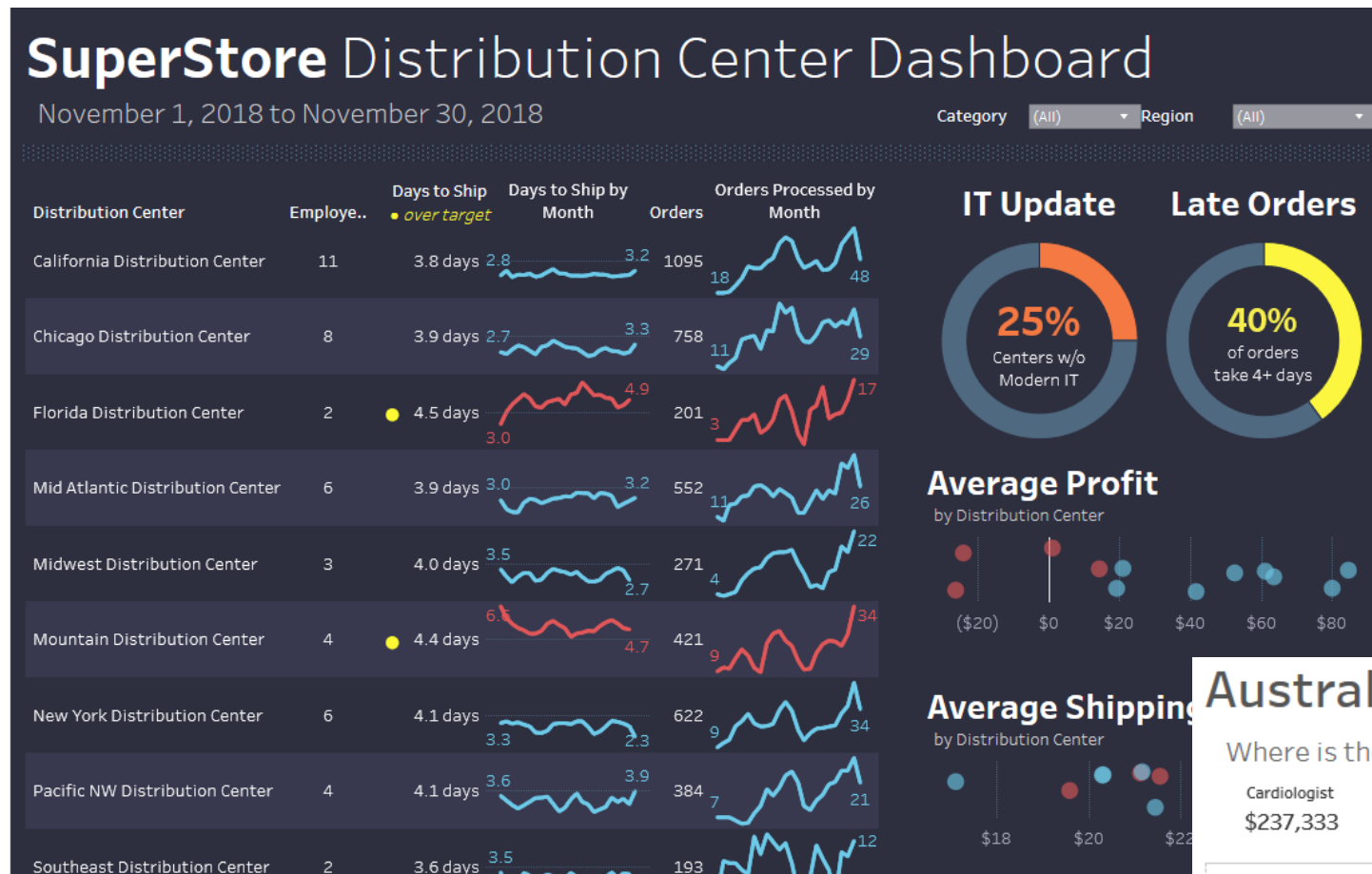
Typeface

- Look hear

- **LOOK HERE**

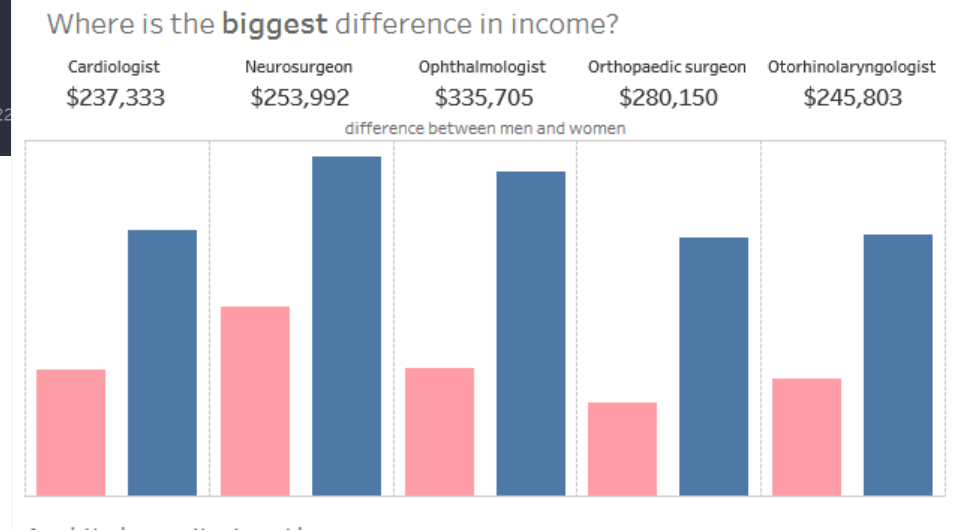
- Influences how text is communicated
- Drives a message
- Organizes information

Typeface

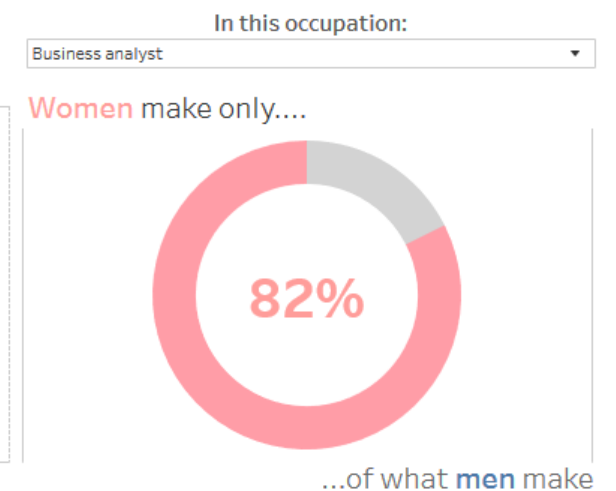


Credit: Allison Montgomery (@AllMontgomery18)

Australian Income: Men vs. Women



Is the "wage gap" real?



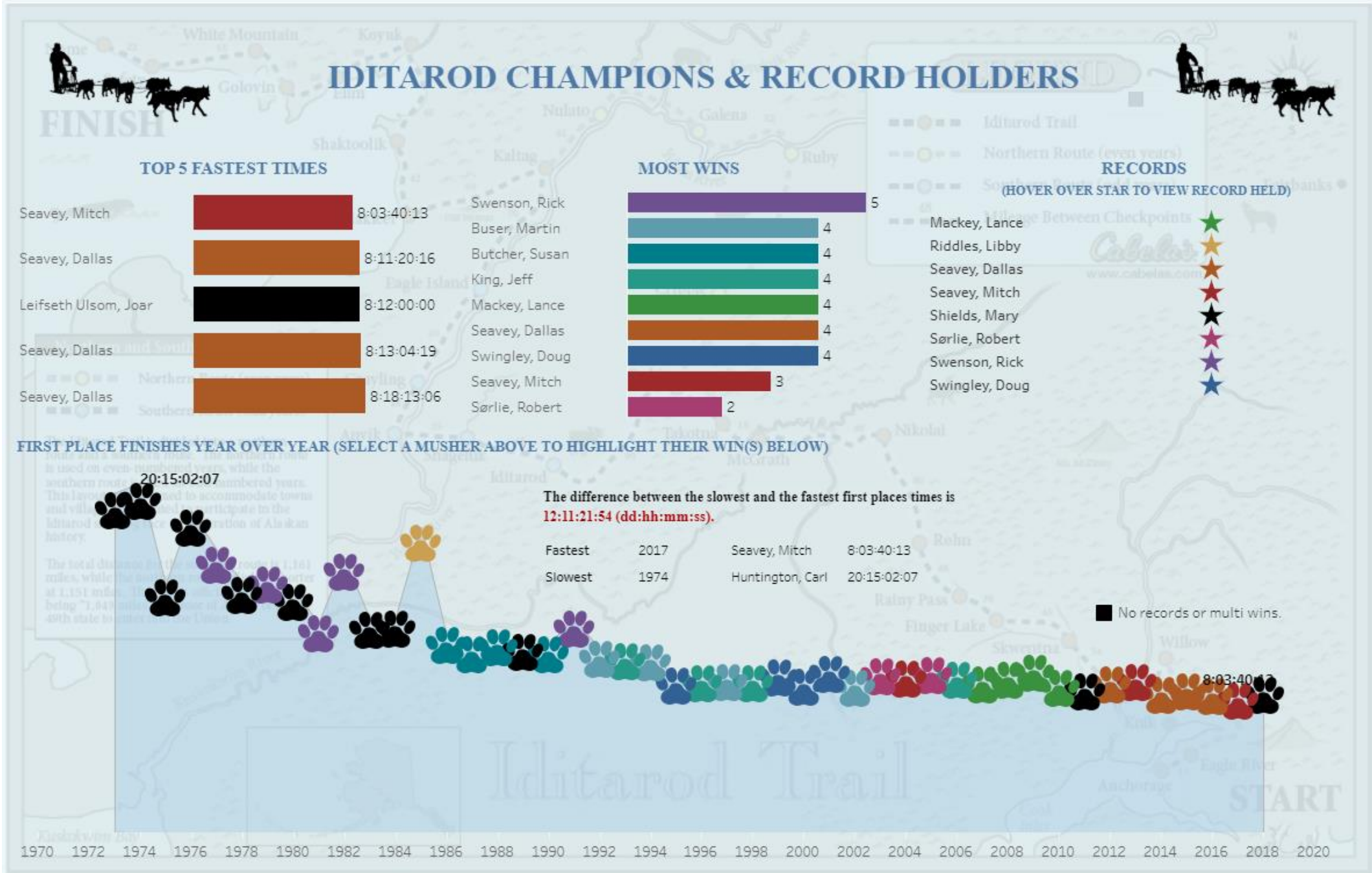
Credit: Adam McCann (@adamemccann)

Charm

- Very subjective
- Fine line – don't over do it
- Reinforces narrative and increases engagement
- Uses custom images, branding, etc.
- Tableau Public vs business setting

Charm

Credit: Leslie McPhee (@getVizzy)



Charm



Wrap up

- Visualizing data helps identify trends and craft a story
- Know the historical “rules,” but know that rules are meant to be broken
- Five elements of dashboard design: ***integrity, flow, color, typeface, charm***
- Clarity, Context, and Consistency!
- Get out of the way of your data

Links

- https://www.edwardtufte.com/tufte/books_vdqi
- <https://www.amazon.ca/Visual-Display-Quantitative-Information/dp/1930824>
- <https://www.artplusdata.com/>

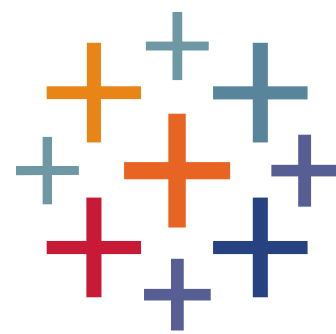
- Don't forget – get involved in your analytics community!
 - #datafam
 - Tableau user groups
 - Tableau virtual events
 - DAMA (**DA**ta **M**anagement **A**ssociation)
 - Data groups on Meetup, Eventbrite, etc

Let's Connect!

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- <https://public.tableau.com/profile/jason.harmer>

If connecting on LinkedIn, please include a message about this webinar





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