Northwestern University

Introduction to Data Visualization & Data Storytelling

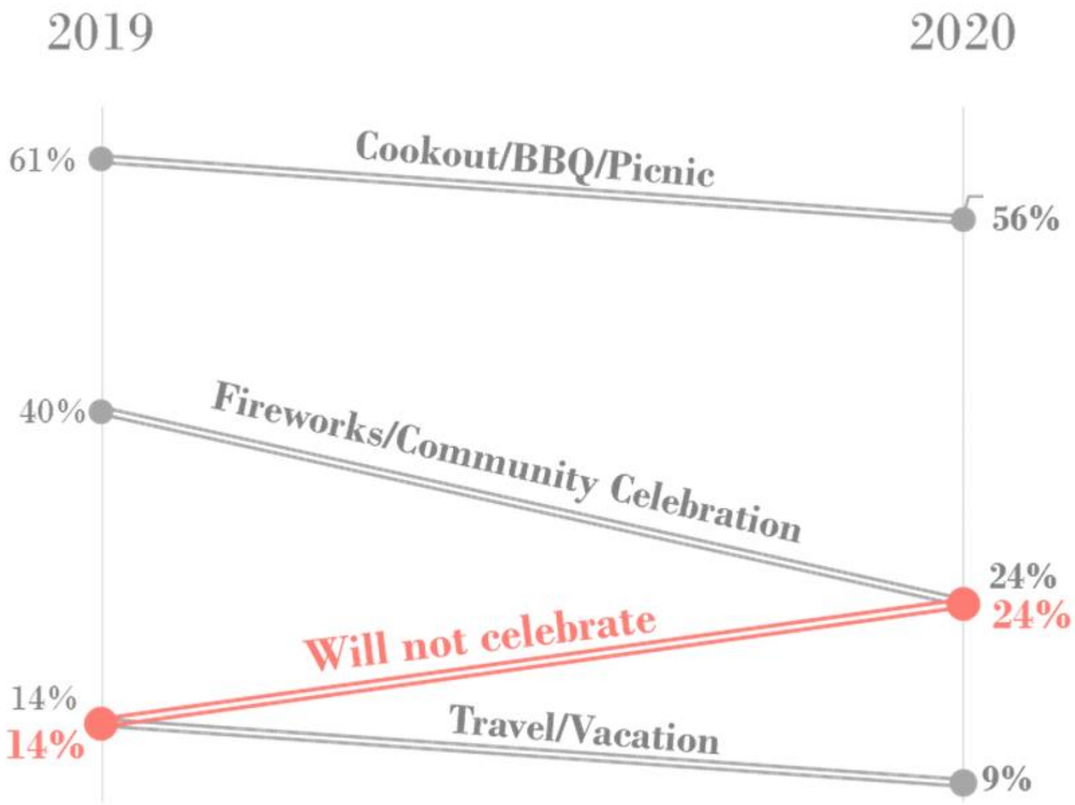
Week 3

Recap

Core Rules in Data Visualization

In 2020, 1 in 4 Americans will not to celebrate Independence Day

Independence Day celebration plans

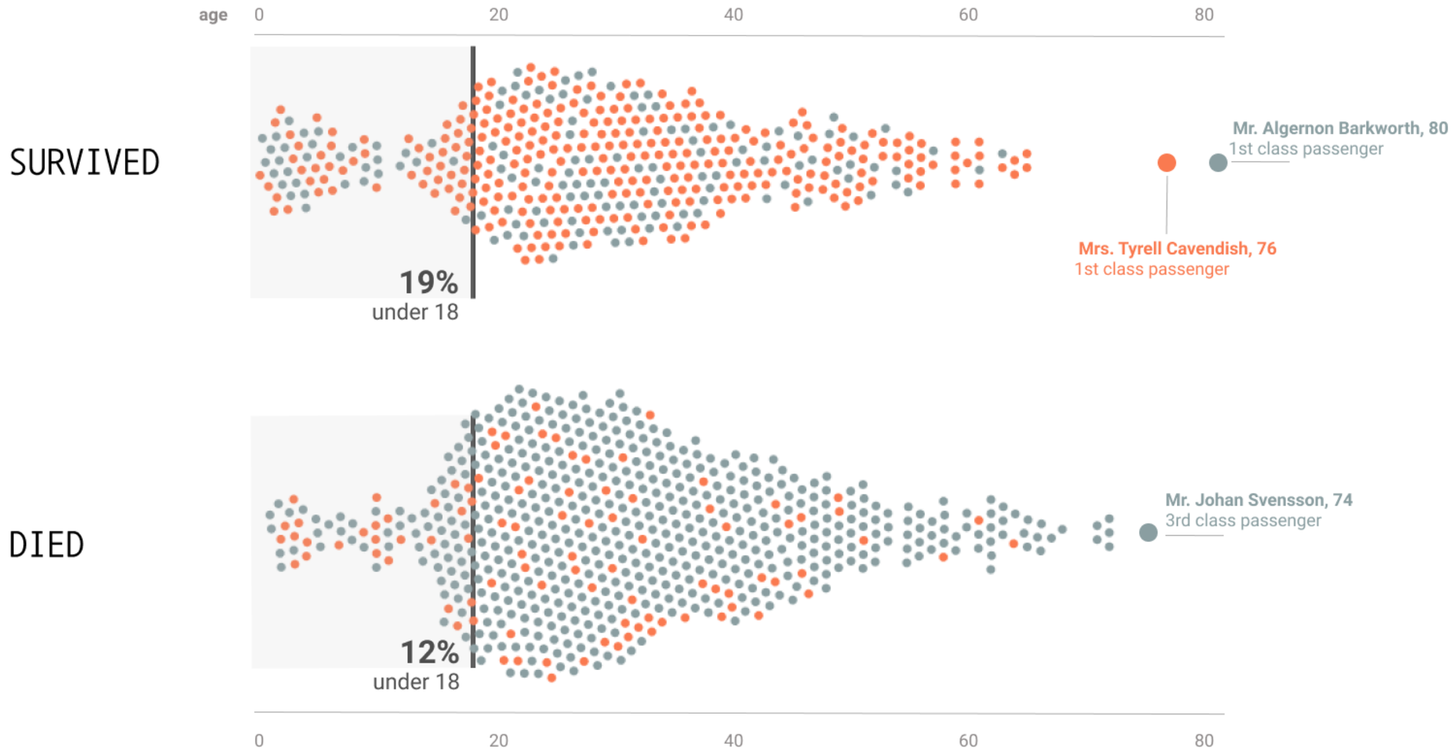


Data source: NRF and Prosper Insights & Analytics survey
7,762 consumers, conducted June 1-June 9, 2020, margin of error +/- 1.1%

Source: personal data visualization

WHO SURVIVED THE TITANIC?

The “Women and children first” (WCF) policy gave women and kids a survival advantage over men



Source: personal data visualization

AWB | USF

EDUCATION
IS KEY TO A FLOURISHING SOCIETY

THE POWER OF ONE: Through the **"train-the-trainer" model** that AWB uses, each project builds local capacity and expertise, creating sustainable programs that are multiplied and persist long after the volunteers return home.

Impact of 1 AWB "Train the Trainer" model
1 trainer works with 5 local faculty.
Each local faculty teaches 25 students.
Each student then impacts on avg. 50 citizens.
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Impact of 1 Regular Visiting Instructor
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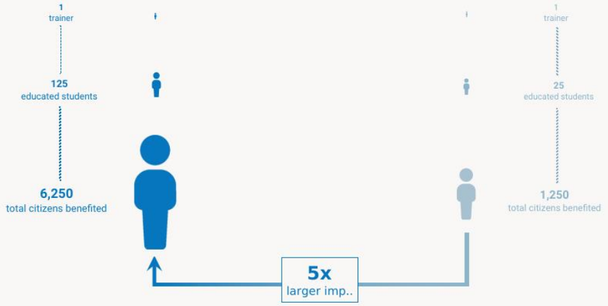
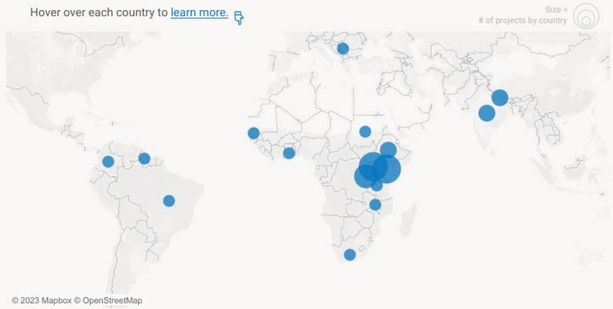


DIVERSITY OF IMPACT: In 2018 and 2019, AWB worked on **32 projects** across **16 countries**.
Each project and each country has its own unique story.

Hover over each country to learn more.



-> DONATE! Help us educate, inspire..

There are many things developing nations need to foster sustainable health and prosperity; **education** is often the forgotten ingredient. **Academics Without Borders (AWB)** works to change that by helping developing nation universities build the programs, capacity and plans they need to educate the next generation of professionals and leaders.

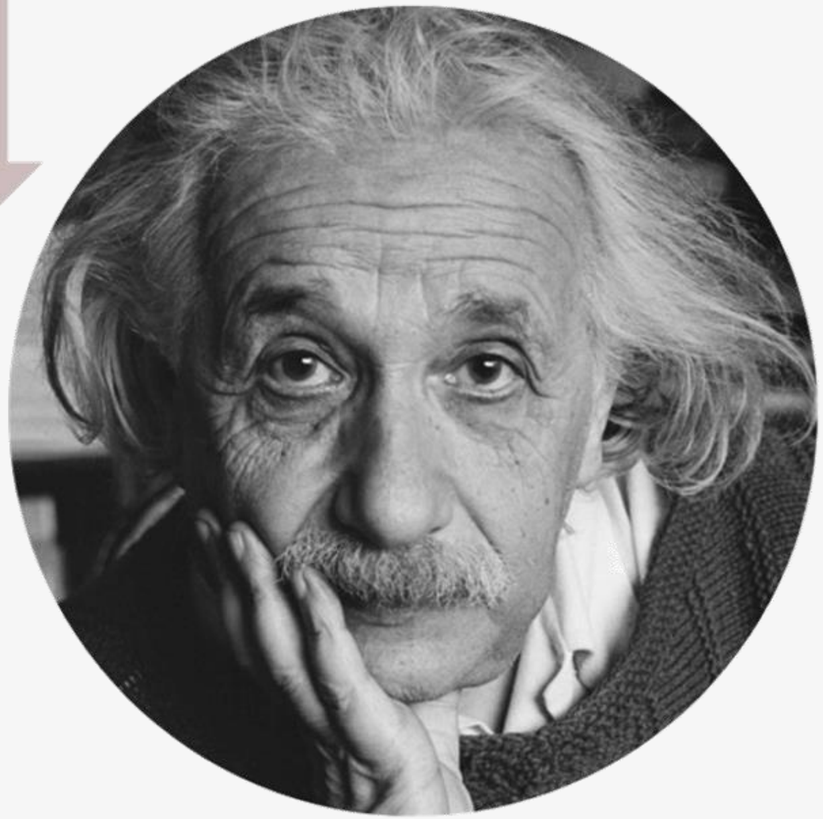
Data: Academics Without Borders, 2018-2019 UNDP
Photo: Unsplash
Icons: The Noun Project
Design: Rebeca Pop

Source: personal data visualization

Let's Chat!

Data Visualization Best Practices

Picture Yourself Somewhere Here



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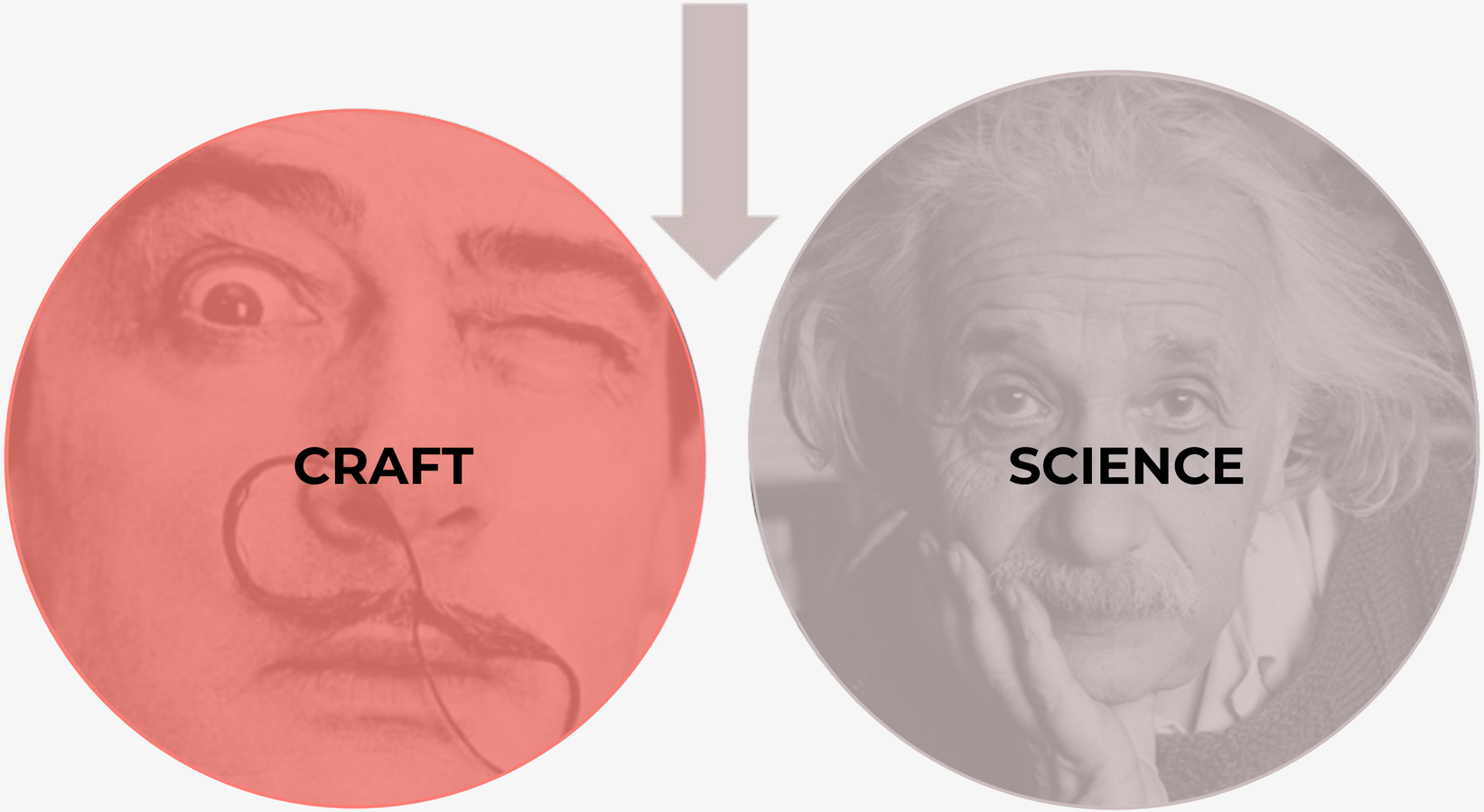
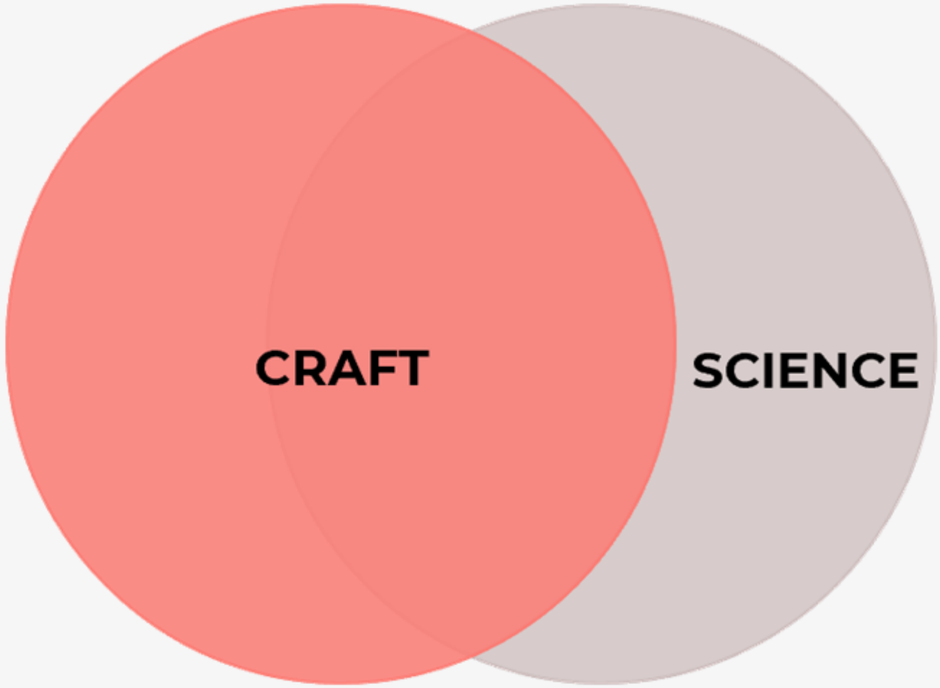


3 Schools of Thought

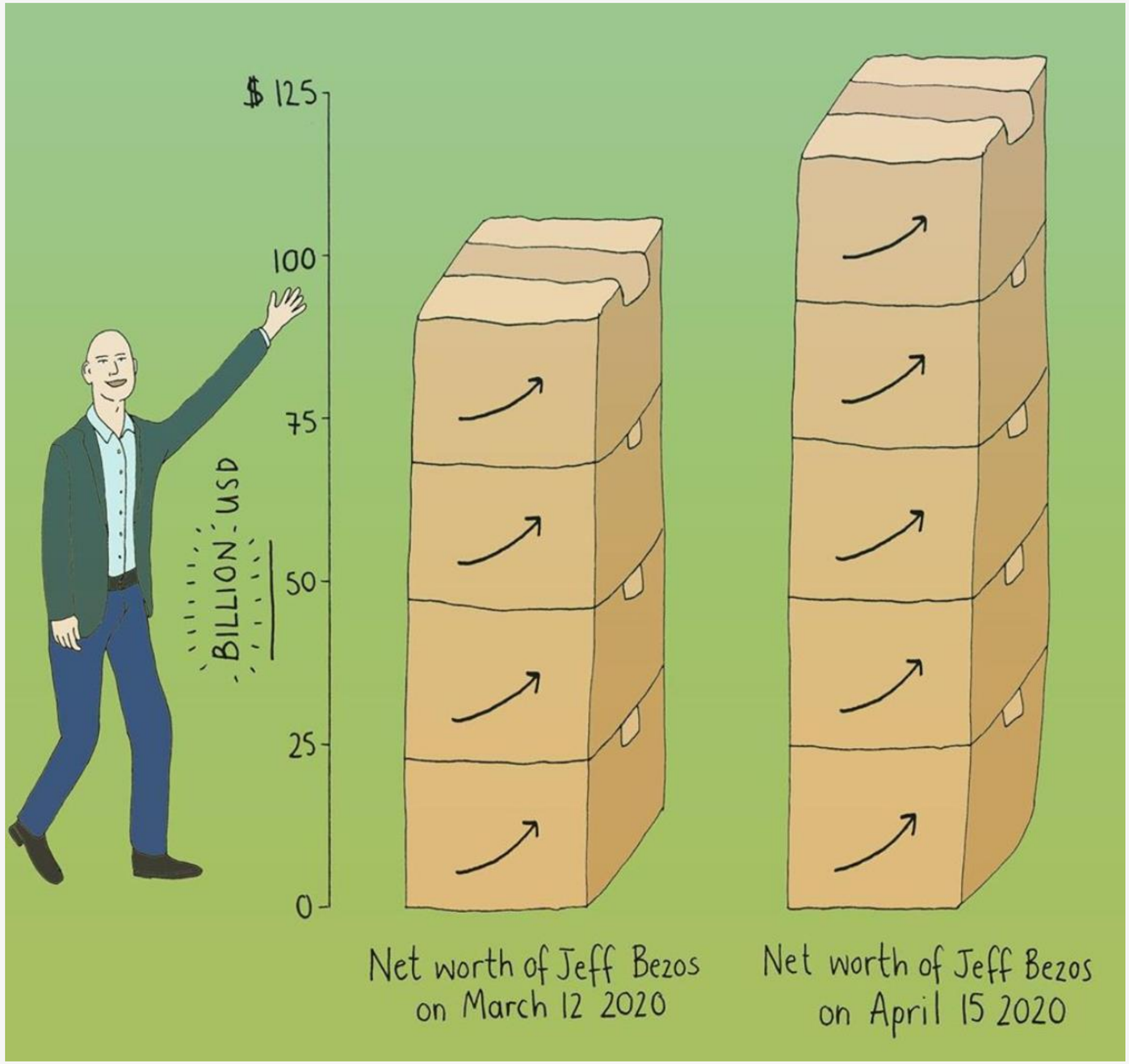
JOURNALISM



BEAUTY

UNDERSTANDING

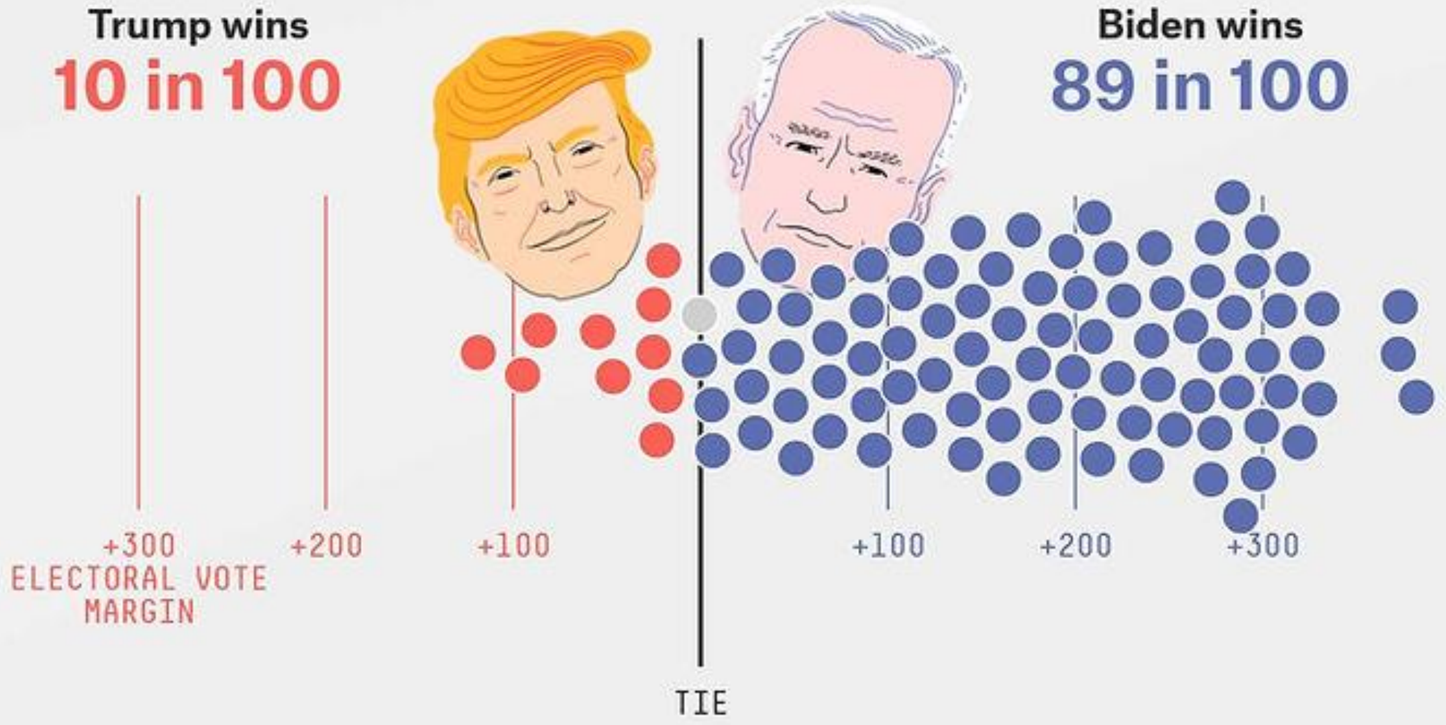
IMPLICATION



Author: Mona Chalabi

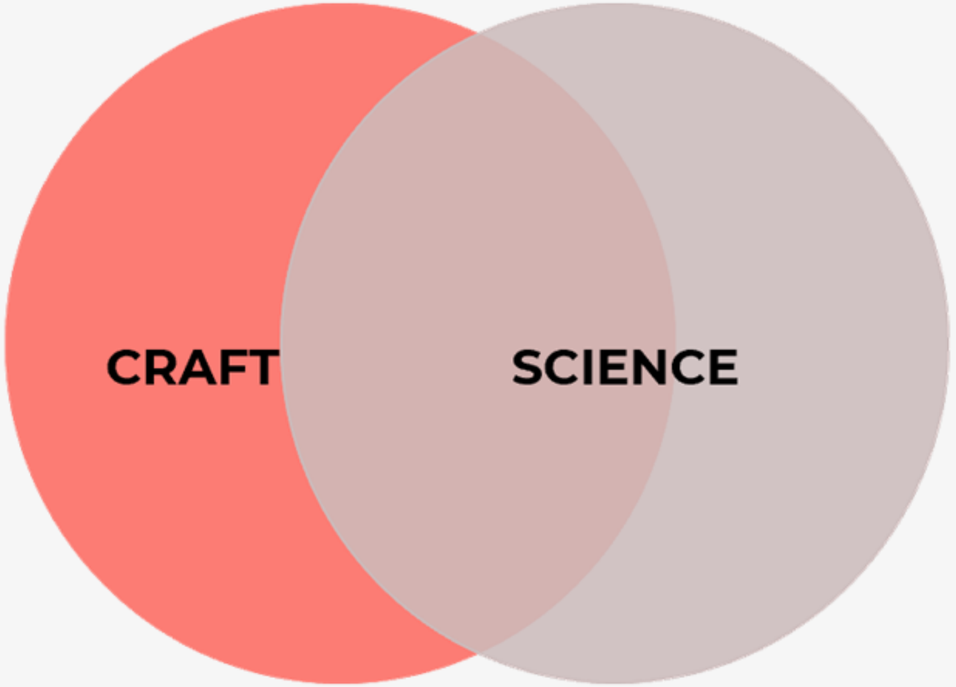
Biden is *favored* to win the election

We simulate the election 40,000 times to see who wins most often. The sample of 100 outcomes below gives you a good idea of the range of scenarios our model thinks is possible.



Author: FiveThirtyEight

BUSINESS DASHBOARDS (EXPLORATORY)



UNDERSTANDING

IMPLICATION

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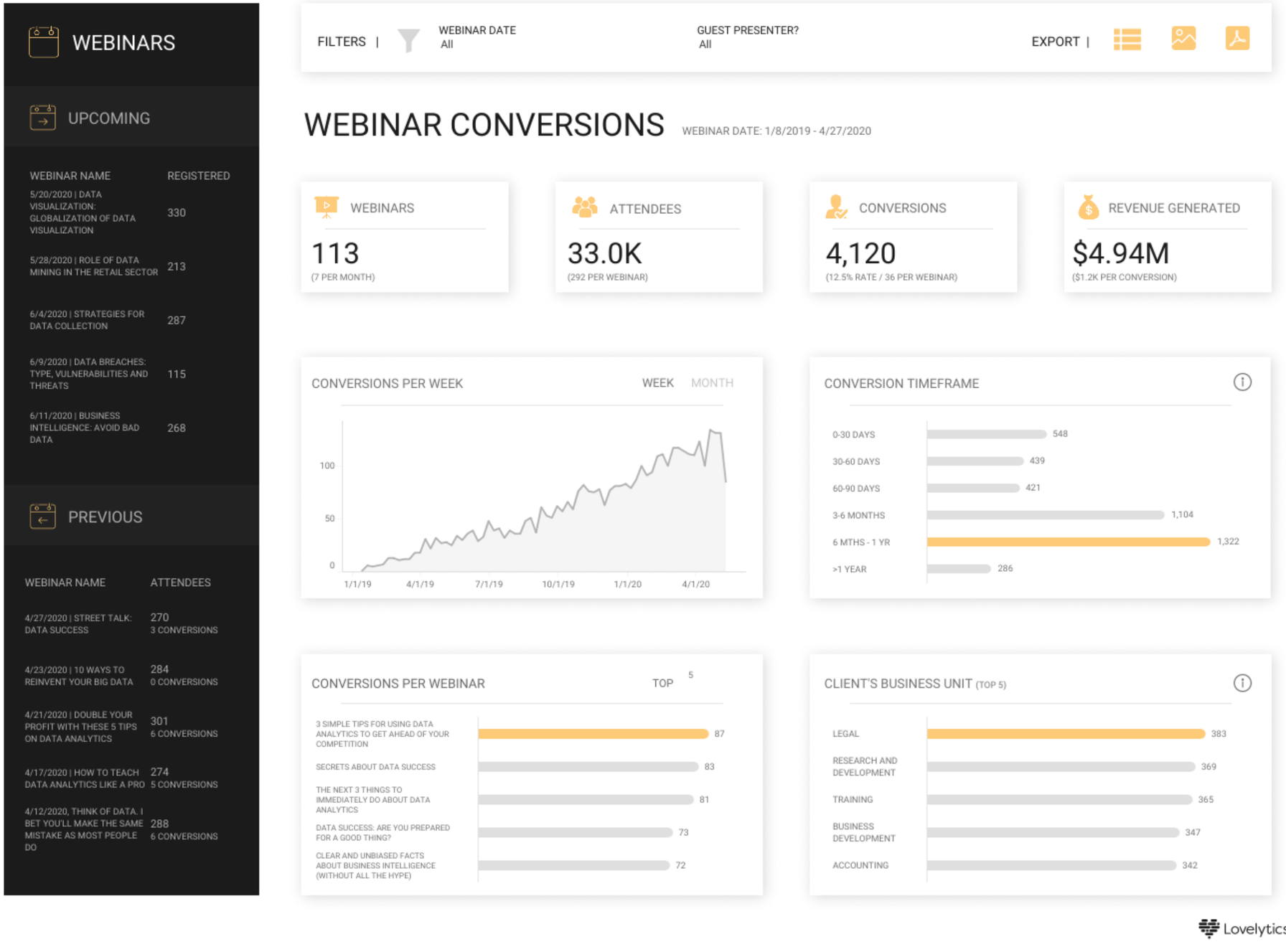
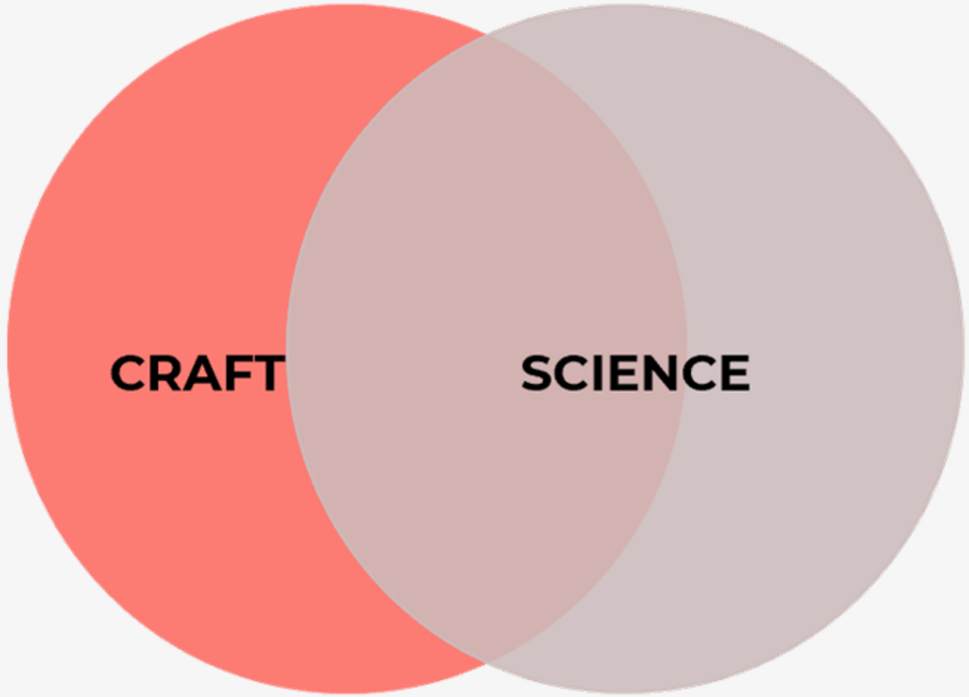


Source: Lovelytics

BUSINESS DATA VISUALIZATION (EXPLANATORY)



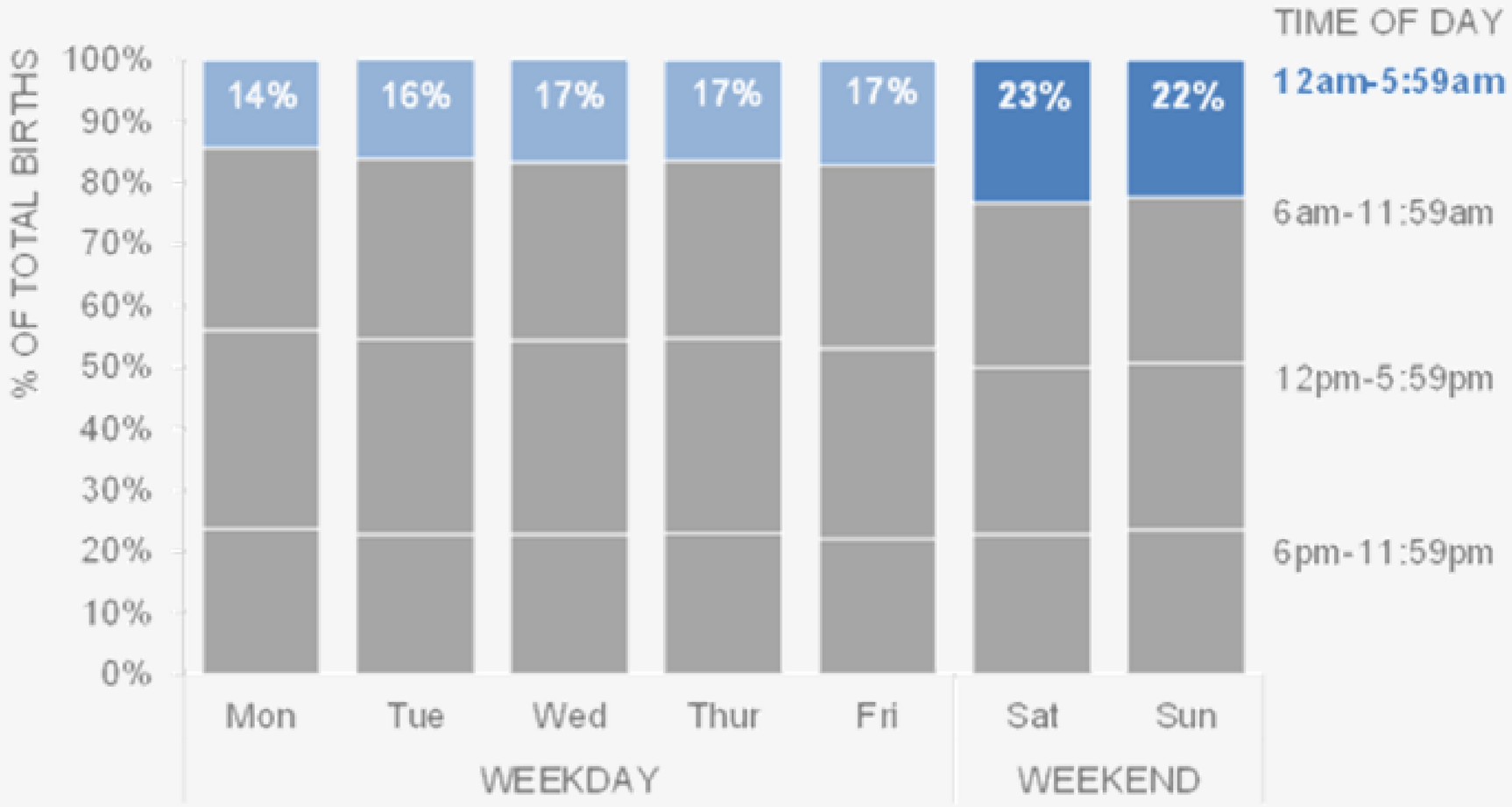
IMPLICATION

UNDERSTANDING

BEAUTY

When babies are born

Weekend deliveries are more likely to be in early morning, compared to weekdays

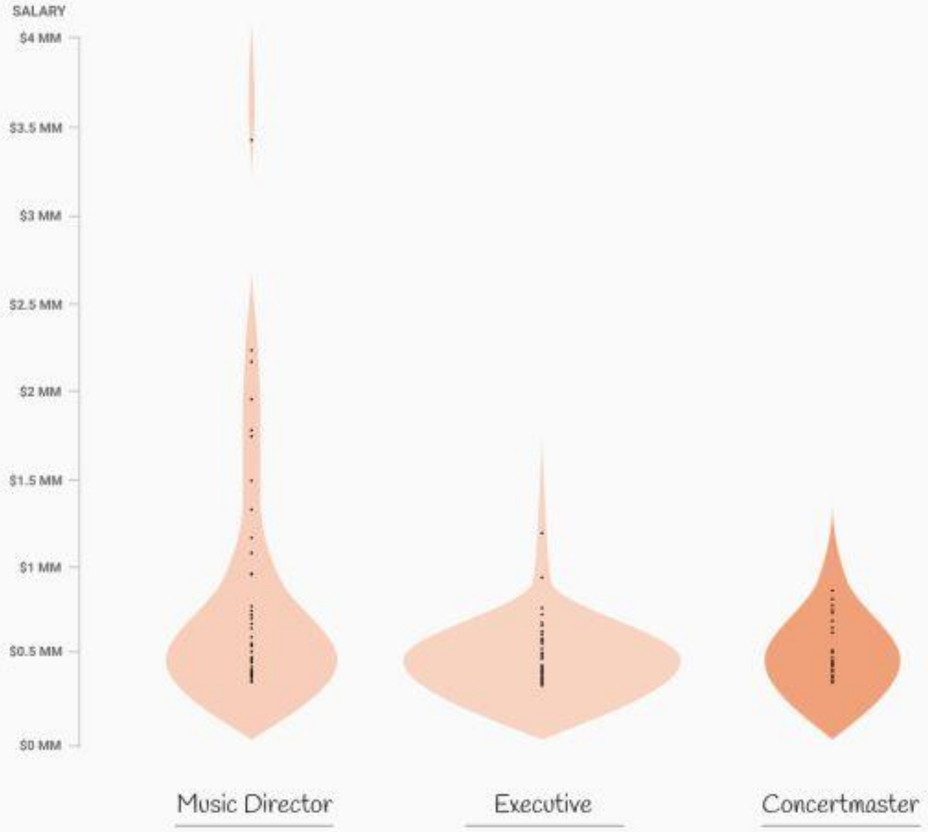


Data source: CDC (National Vital Statistics Reports, Vol. 67, No. 1, January 31, 2018)

Source: www.storytellingwithdata.com

Unlike Music Directors, top Concertmasters don't make millions

Concertmasters are first chair violinists of an orchestra. The Adaptistration orchestra compensation reports is a big picture overview of all compensation across US.



Source: Adaptistration Comensation Report 2020
Author: Rebeca Pop, Vizlogue

vizlogue

Source: personal data visualization

AWB | USF

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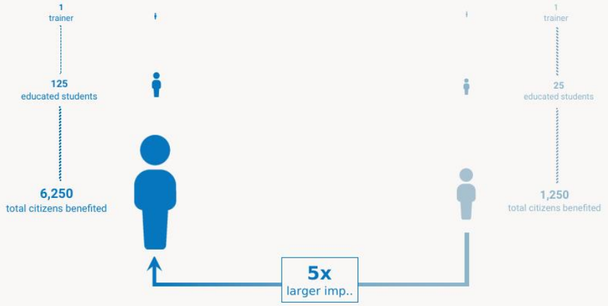

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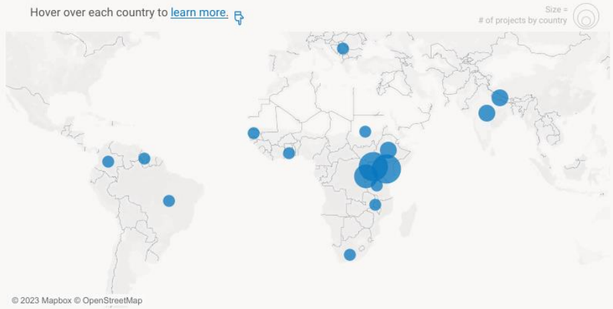

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Data:
Academics Without Borders, 2018-2019
UNDP

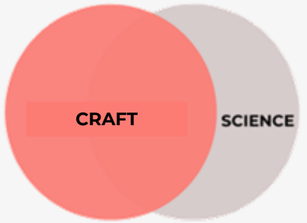
Photo:
Unsplash

Icons:
The Noun Project

Design:
Rebeca Pop

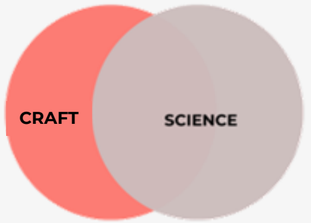
Source: personal data visualization

JOURNALISM



BEAUTY
UNDERSTANDING
IMPLICATION

BUSINESS DASHBOARDS
(EXPLORATORY)



UNDERSTANDING
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BEAUTY

BUSINESS DATA VISUALIZATION
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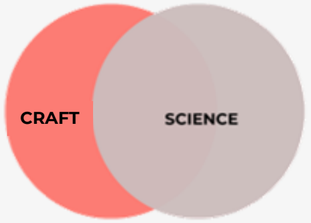

IMPLICATION
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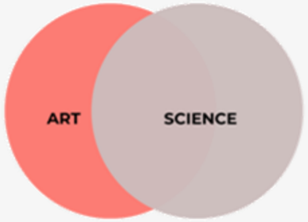

UNDERSTANDING

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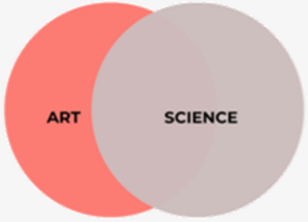


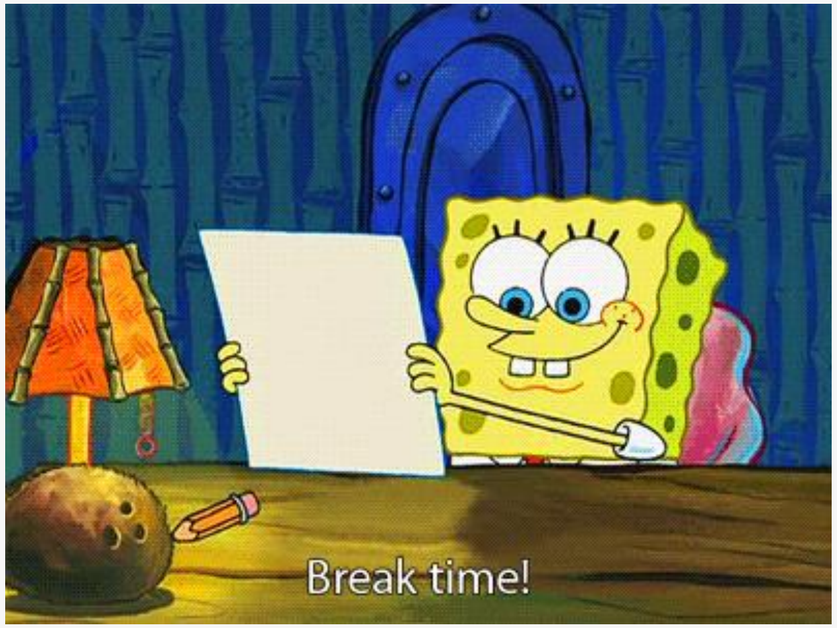
IMPLICATION

UNDERSTANDING

BEAUTY

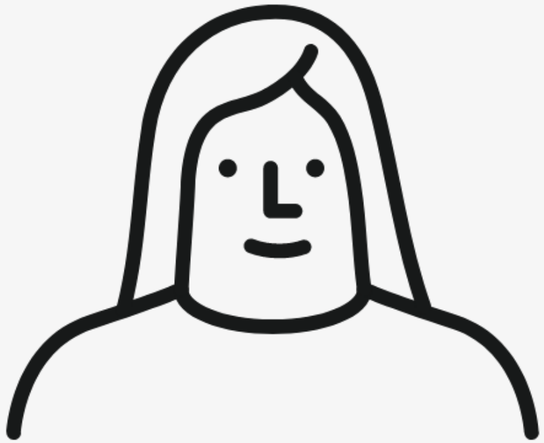
Break

15 minutes

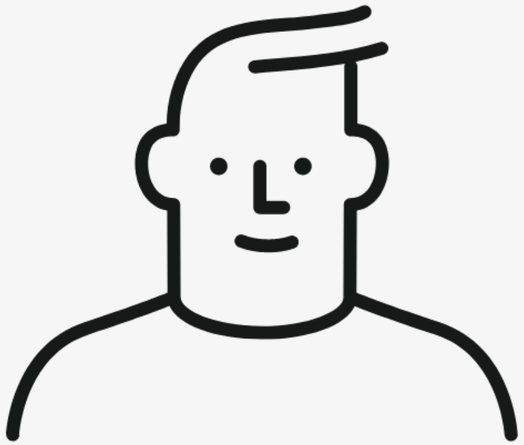


Business Data Visualization

PRACTITIONER



RESEARCHER



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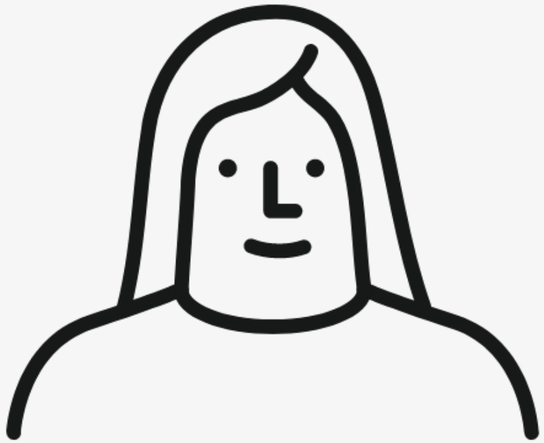


Data Visualization Practitioners

Stephen Few

Edward Tufte

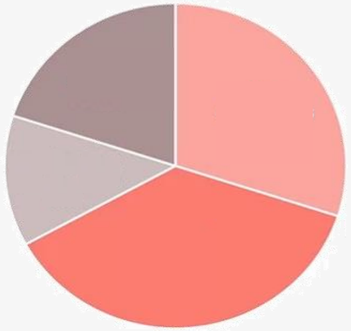
Cole Knaflic

Stephanie Evergreen

Andy Kirk

Andy Kriebel

Pie Charts



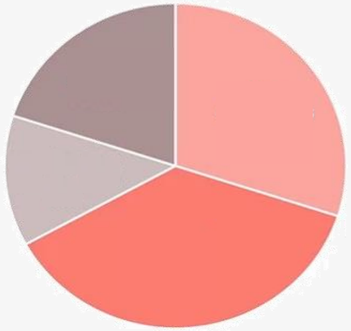
Stephen Few

Edward Tufte

*"**Save the Pies for Dessert.***
*Of all the graphs that play major roles in the lexicon of quantitative communication, however, **the pie chart is by far the least effective**. Its colorful voice is often heard, but rarely understood. It mumbles when it talks."*

*"A table is nearly always better than a **dumb pie chart**; the only thing worse than a pie chart is several of them [....] Given their low data-density and failure to order numbers along a visual dimension, **pie charts should never be used**."*

Pie Charts



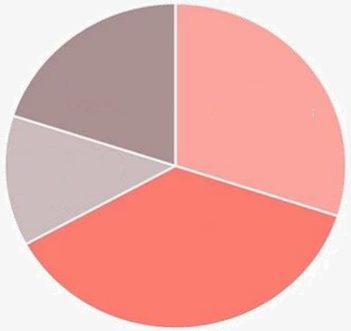
Cole Knaflic

“death to pie charts.
I hate pie charts.

I mean, really hate them.

Those who have heard me speak on data visualization will have learned that the only thing I hate more than a pie chart is a 3D, exploding pie chart - they are the absolute worst - but the plain vanilla pie charts are pretty bad, too.”

Pie Charts



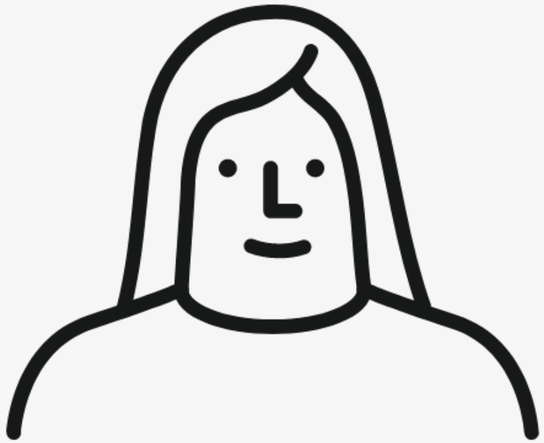
Google

pie charts are

- pie charts are **bad**
- pie charts are **presented in textbooks and magazines as**
- pie charts are **used for**
- pie charts are **useful for representing**
- pie charts are **best used for**
- pie charts are **useful for quizlet**
- pie charts are **the worst**
- pie charts are **evil**
- pie charts are **terrible**
- pie charts are **useless**

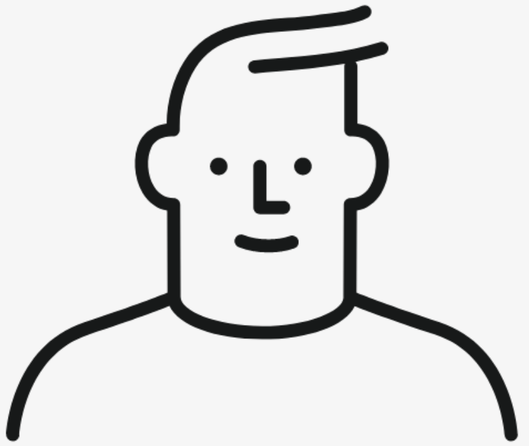
Business Data Visualization

PRACTITIONER

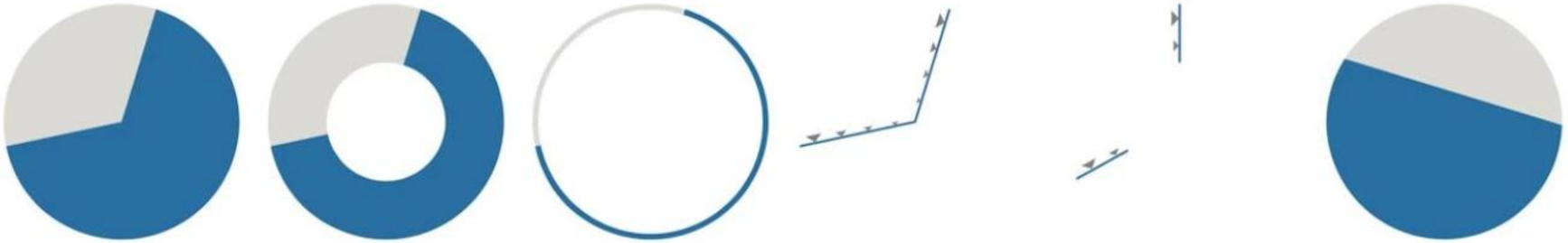


Business Data Visualization

RESEARCHER



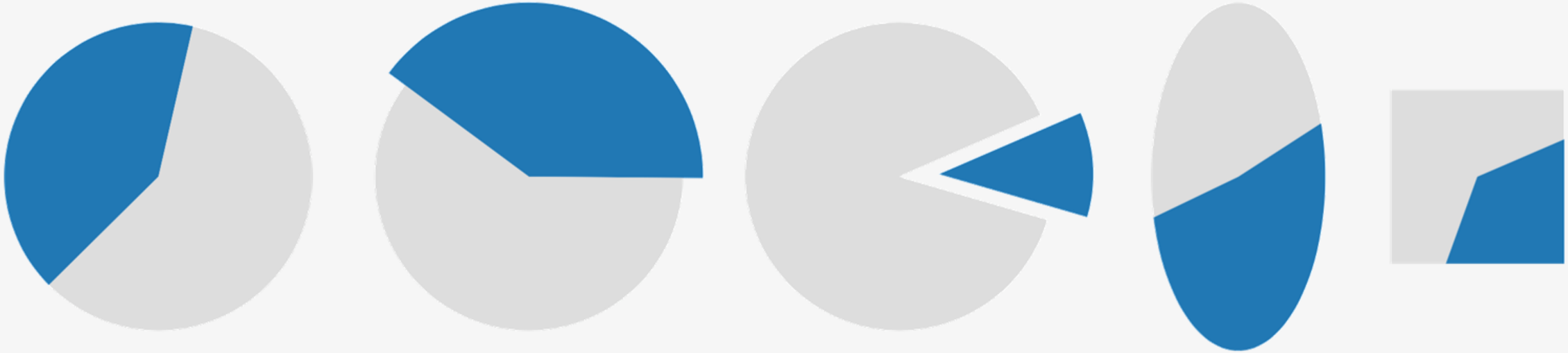
Pie Charts



(a) Pie chart. (b) Donut chart. (c) Arc length chart. (d) Angle pie chart. (e) Angle donut chart. (f) Area chart.

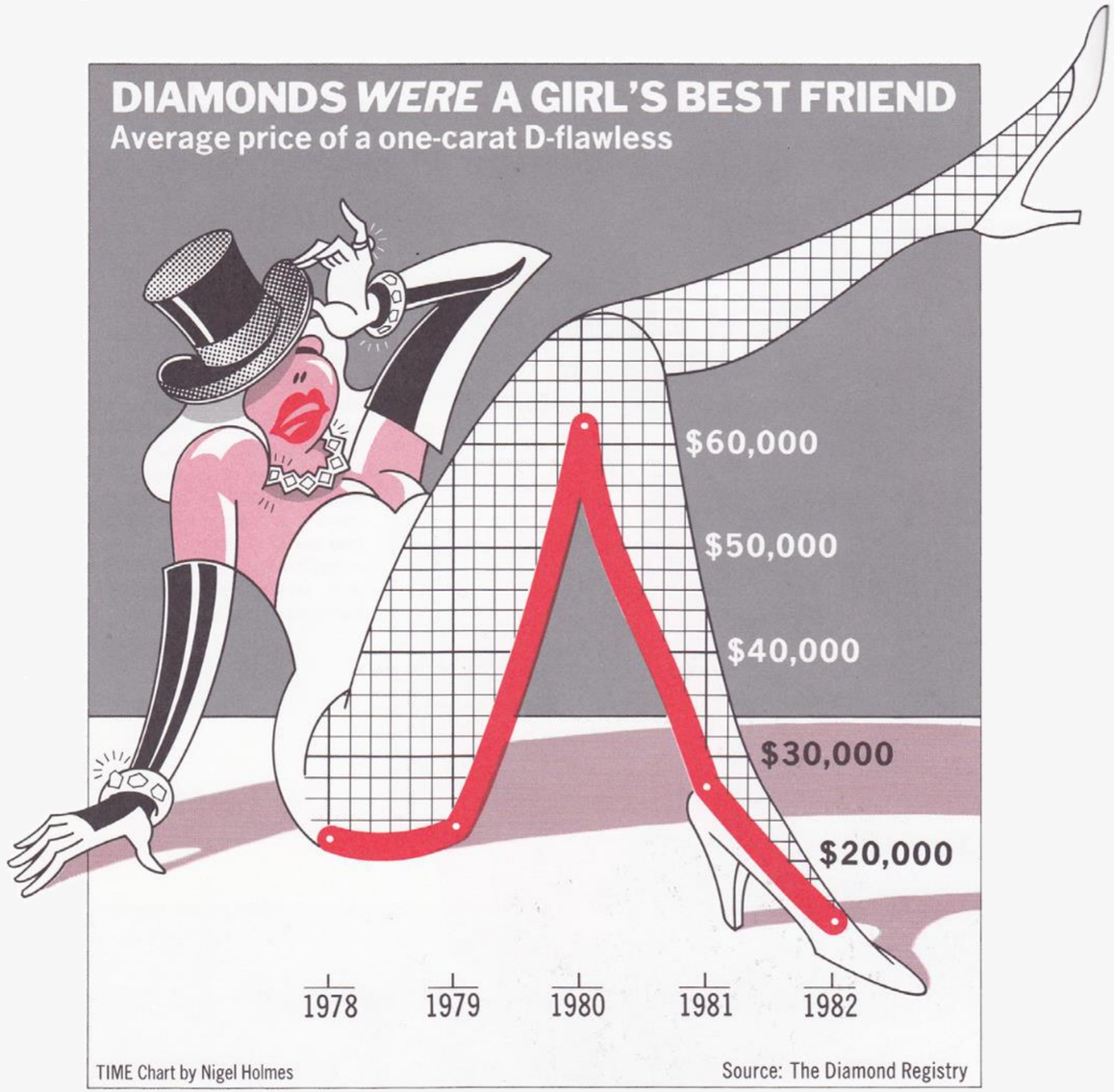
Source: Drew Skau and Robert Kosara , Arcs, Angles, or Areas: Individual Data Encodings in Pie and Donut Charts, 2016

Pie Charts



Pie Charts

Chartjunk

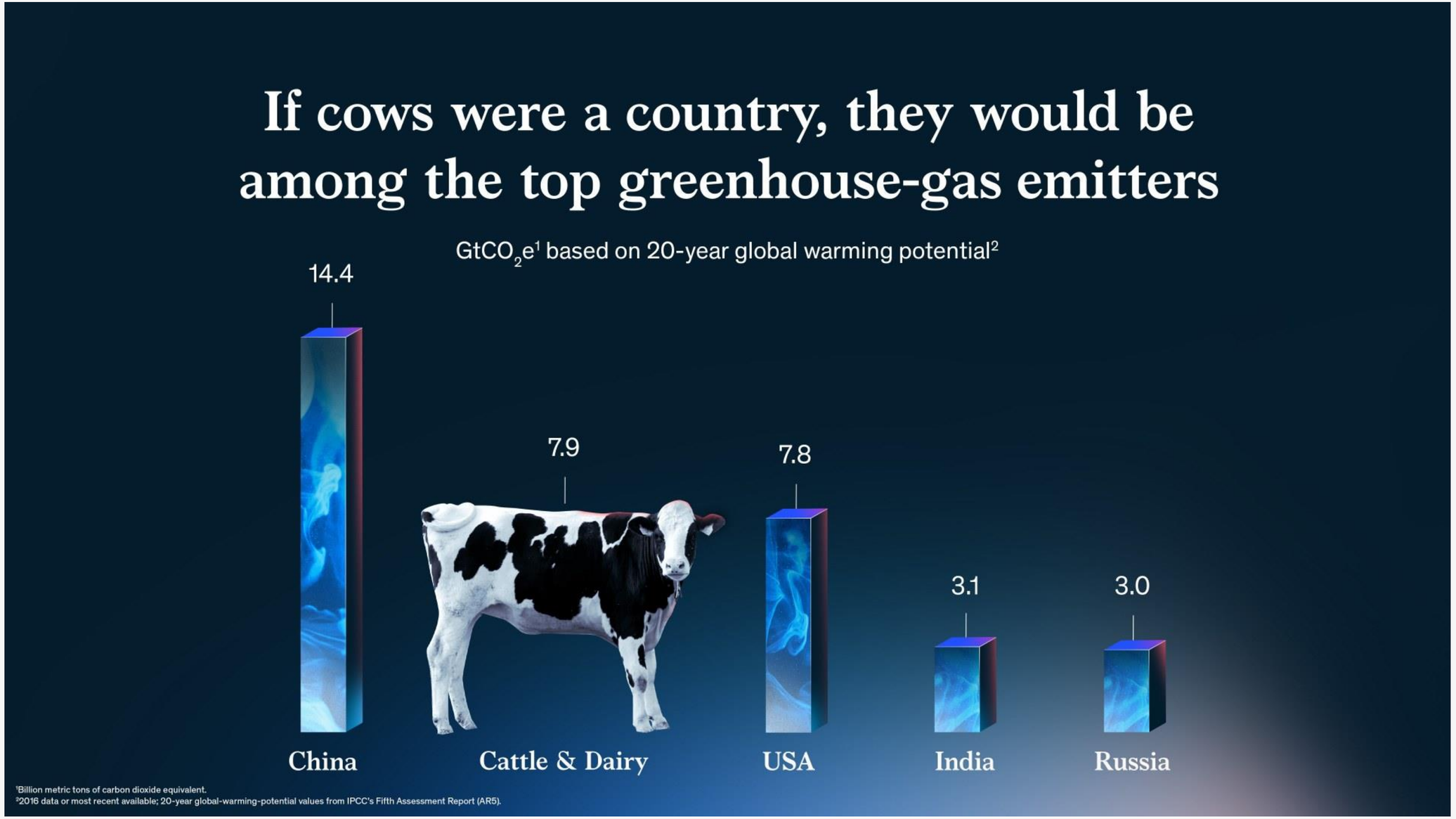


Edward Tufte

"Worse is contempt for our audience, designing as if readers were obtuse and uncaring. In fact, consumers of graphics are often more intelligent about the information at hand than those who fabricate the data decoration. […] Disrespect for the audience will leak through, damaging communication. What E. B. White said of writing is equally true for information design: ***'No one can write decently who is distrustful of the reader's intelligence, or whose attitude is patronizing.'"***

(Edward Tufte, Envisioning Information, Graphics Press, 1990, p.34-35)

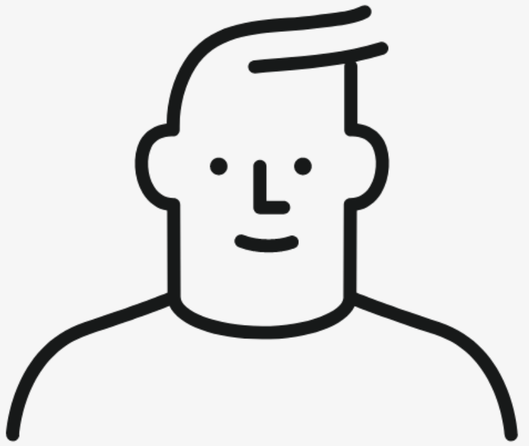
Chartjunk



Source: McKinsey & Company

Business Data Visualization

RESEARCHER



Chartjunk

ISOTYPE Visualization – Working Memory, Performance, and Engagement with Pictographs

Steve Haroz
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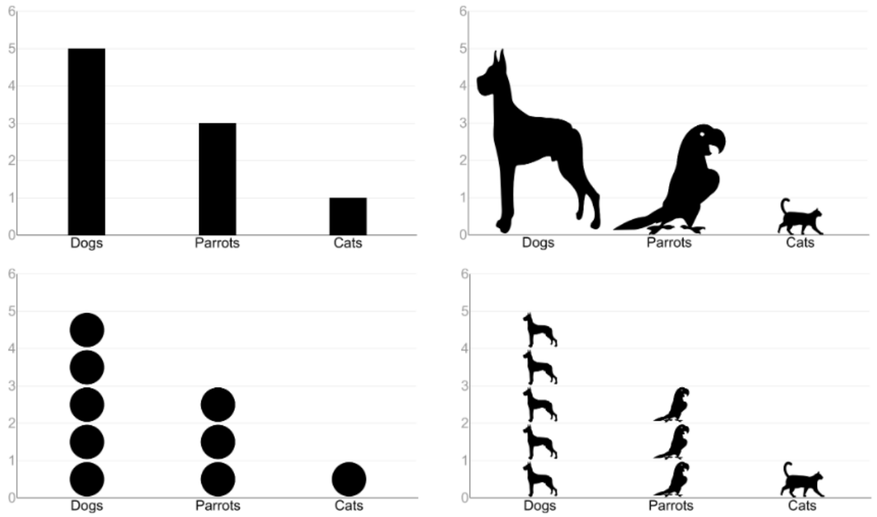
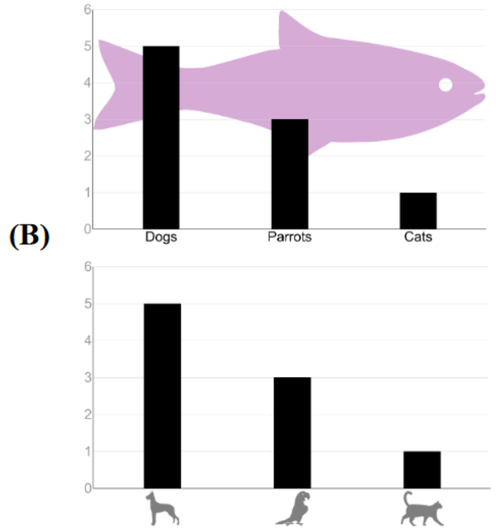
Robert Kosara
Tableau Research
rkosara@tableau.com

Steven L. Franconeri
Northwestern University
franconeri@northwestern.edu



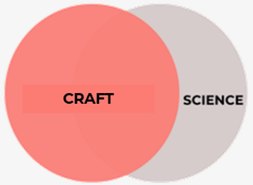
(A)



(B)

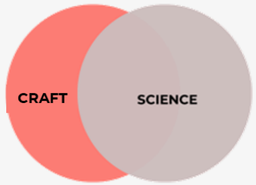
Rules in Data Visualization

JOURNALISM



BEAUTY
UNDERSTANDING
IMPLICATION

BUSINESS DASHBOARDS (EXPLORATORY)



UNDERSTANDING
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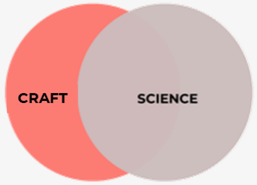

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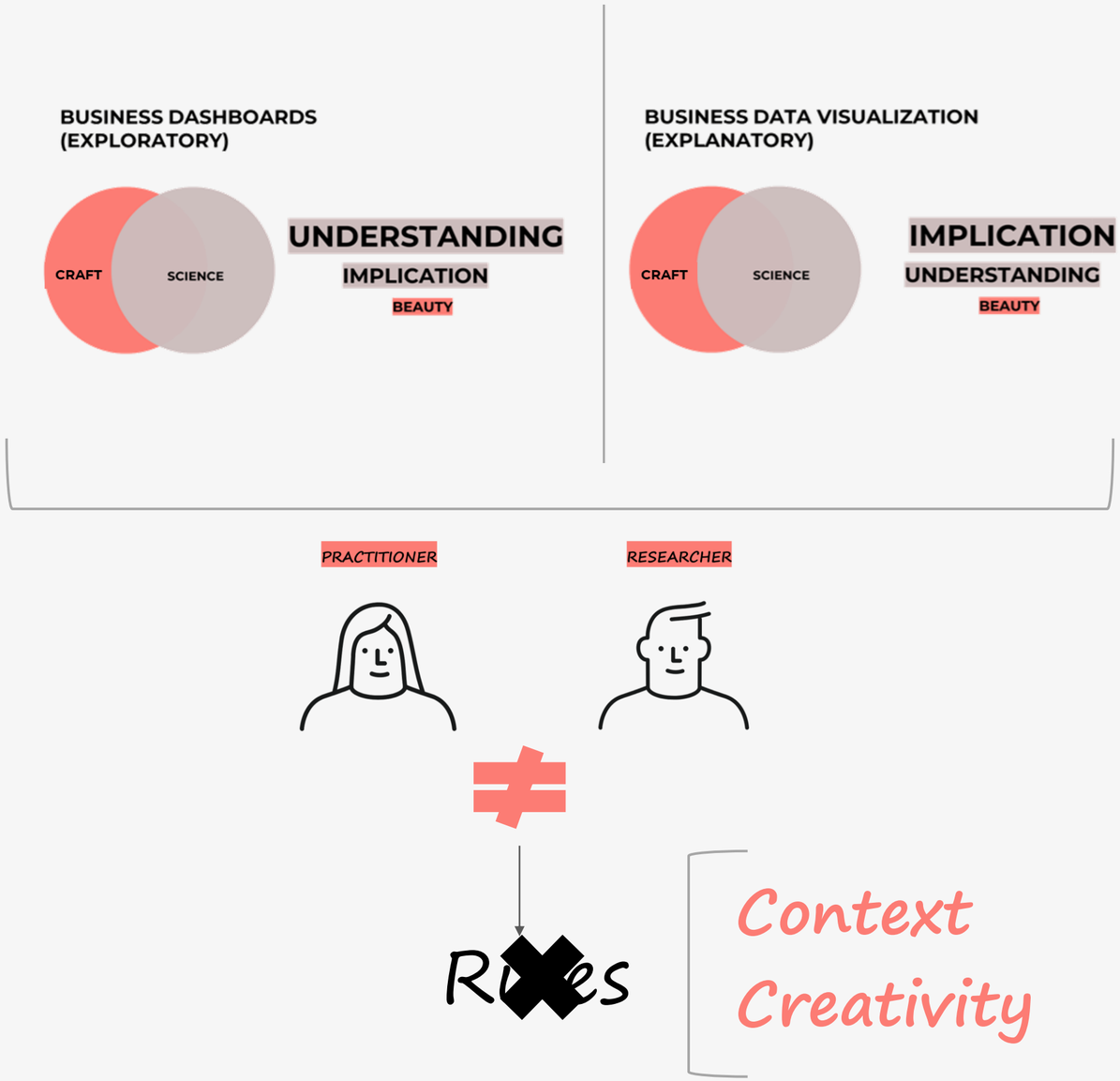
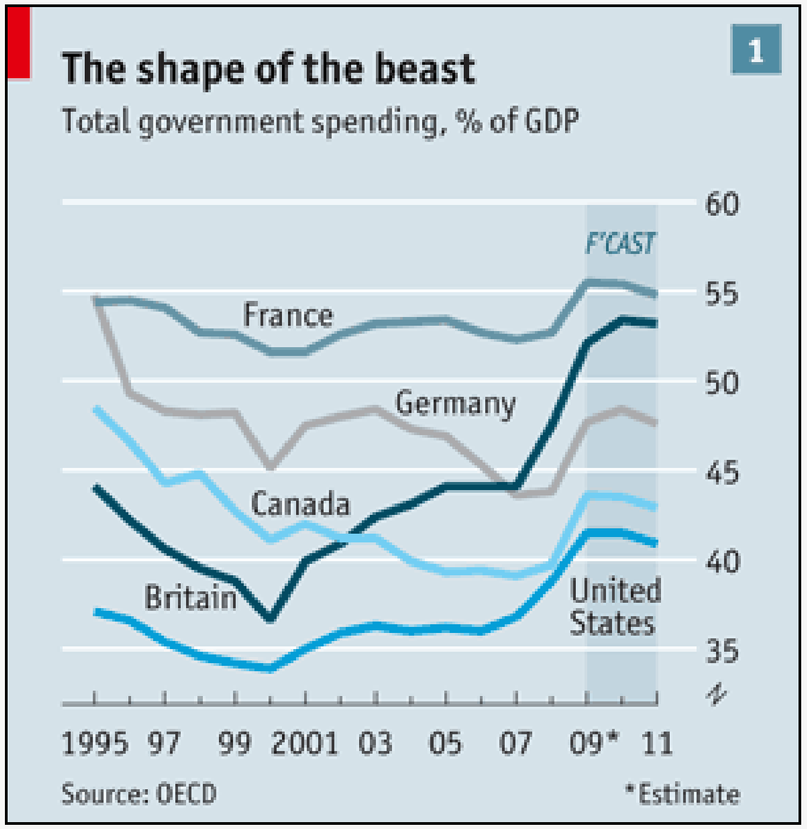
Rules in Data Visualization



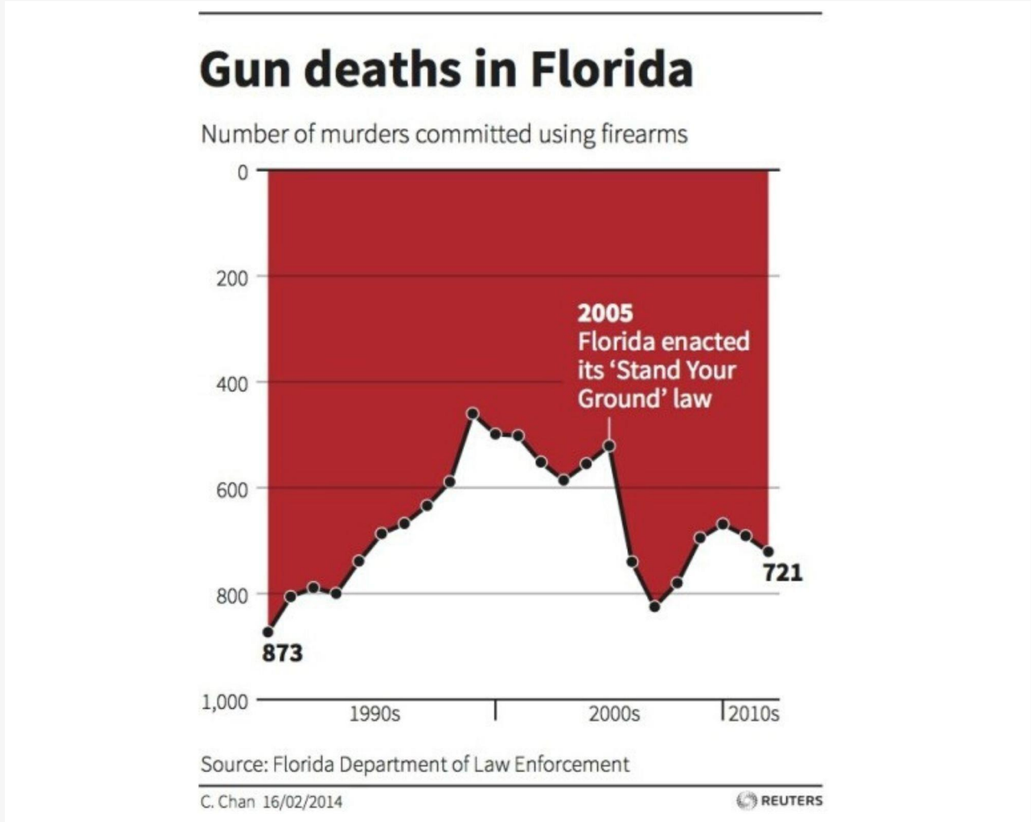
Other Rules: Axes

To truncate or not to truncate?



Source: The Economist

Direction



Source: Reuters

LEARN THE RULES

BREAK THE RULES

Next Week: Frank Elavsky

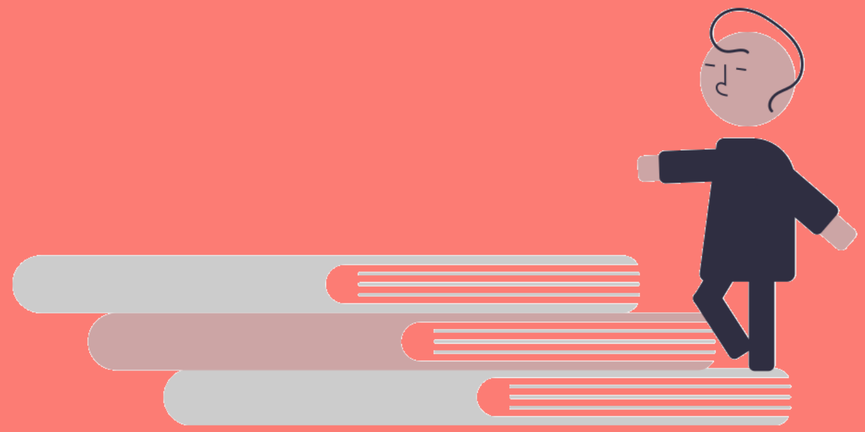
Assignment: Personal Data Viz

Exercise

1. You are an Analytics Manager and are asked to give a short presentation on the topic **Young and Adult Data Literacy Around the World**. Your audience is a group of **UNESCO executives** who are working with local governments to increase literacy rates.

2. Using the data *set Literacy Rates*, work in groups and choose one of the following graphs: **bar chart, dumbbell chart, or slopegraph.** Discuss the pros and cons of each chart type before choosing one.

3. Create the **chart in Tableau**.

4. Let’s discuss!

WHAT DID YOU LEARN?