

Data Visualisation and Dashboarding

Week 9 – Storytelling with data

UNIVERSITY OF
WESTMINSTER 



“After nourishment, shelter, and companionship, stories are the thing we need the most in the world.”

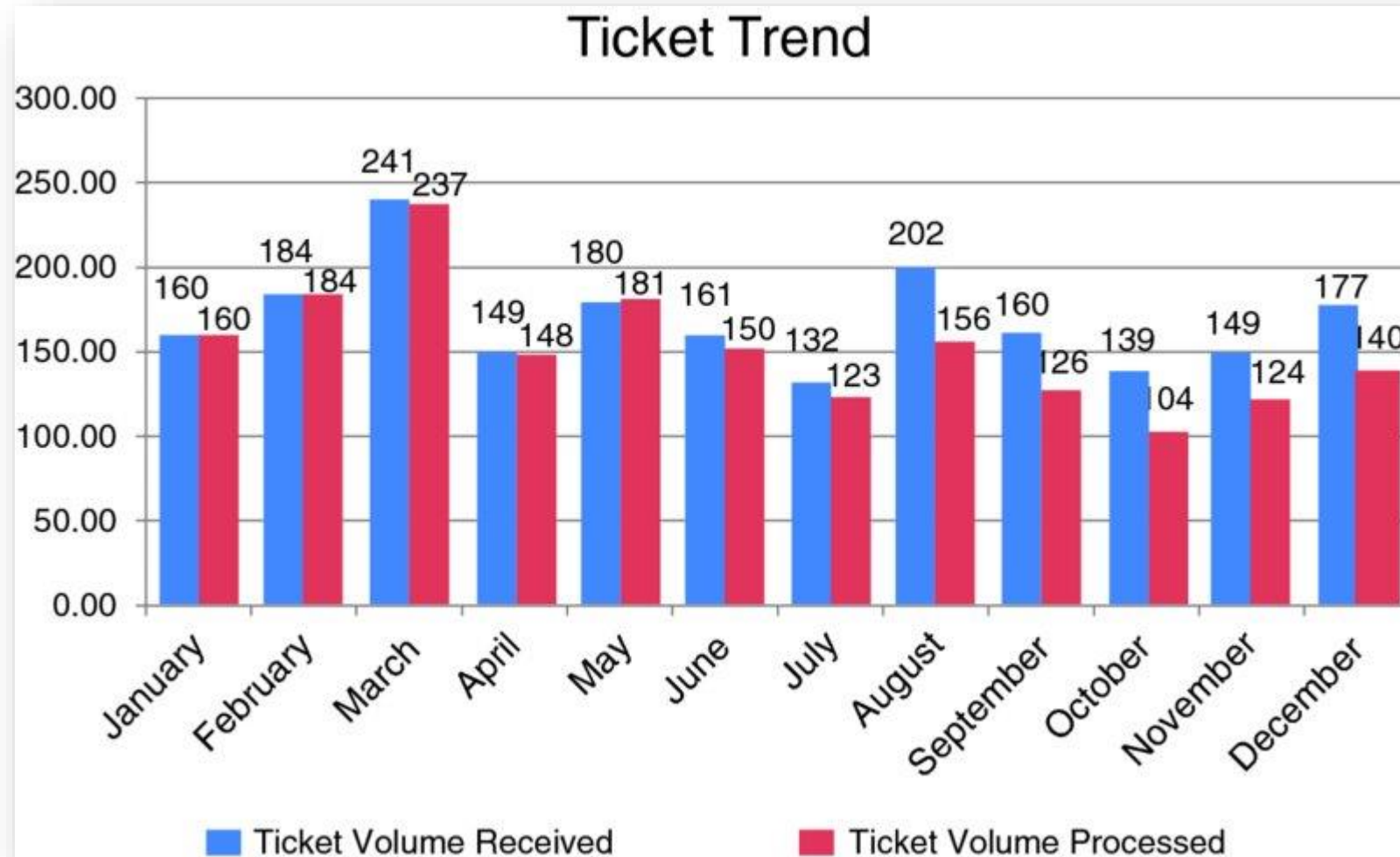
– Philip Pullman

**“Storytelling is the most
powerful way to put ideas
into the world today”**

– Robert McKee

What does this graphic tell us?

Examples from Knaflitz,
C.N.: Storytelling with
data. Wiley, 2015



What about this one?

Please approve the hire of 2 FTEs

to backfill those who quit in the past year

Ticket volume over time



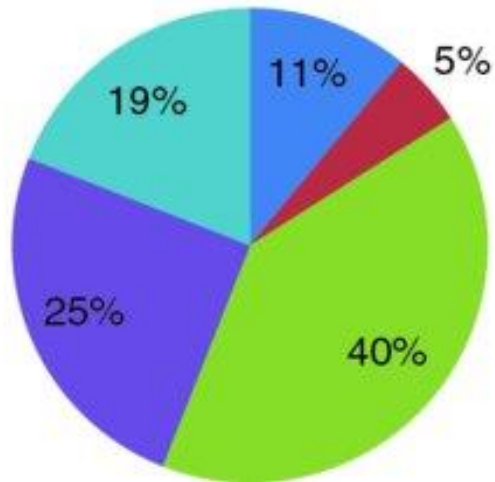
Data source: XYZ Dashboard, as of 12/31/2014 | A detailed analysis on tickets processed per person and time to resolve issues was undertaken to inform this request and can be provided if needed.

This one?

Survey Results

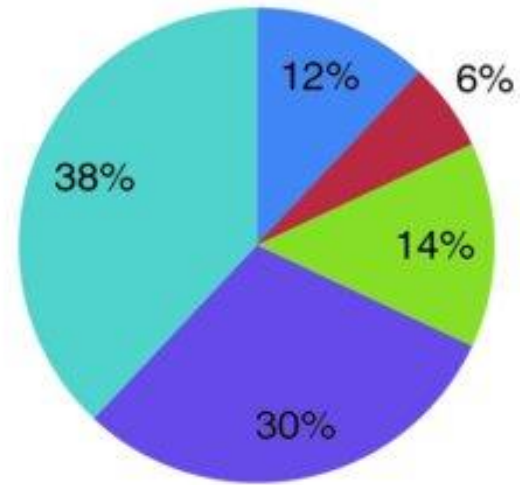
PRE: How do you feel about doing science?

■ Bored ■ Not great ■ OK ■ Kind of interested ■ Excited



POST: How do you feel about doing science?

■ Bored ■ Not great ■ OK ■ Kind of interested ■ Excited

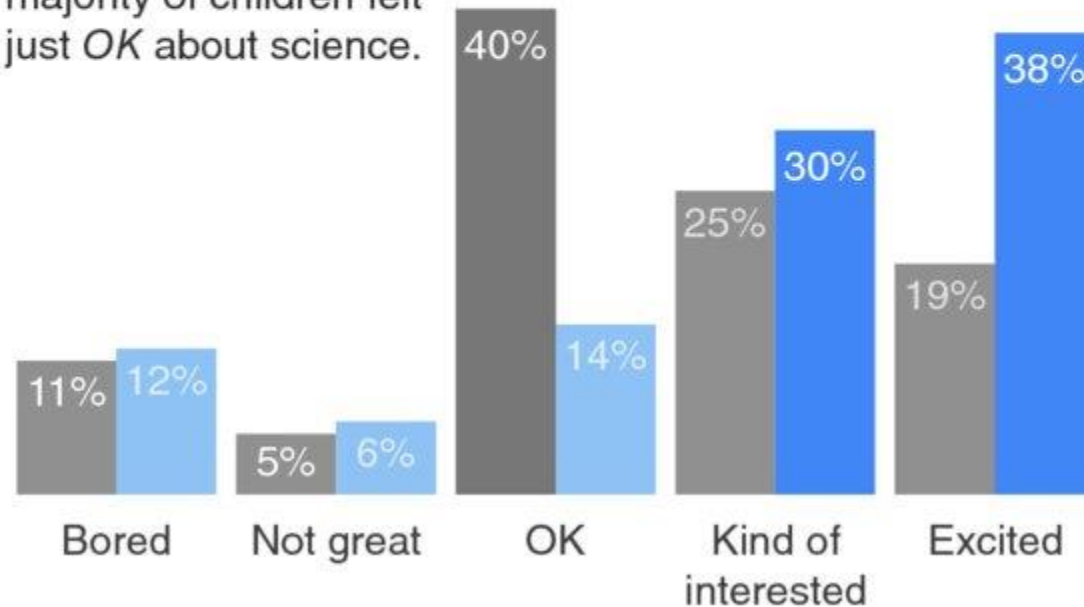


... and this one?

Pilot program was a success

How do you feel about science?

BEFORE program, the majority of children felt just *OK* about science.



AFTER program, more children were *Kind of interested & Excited* about science.

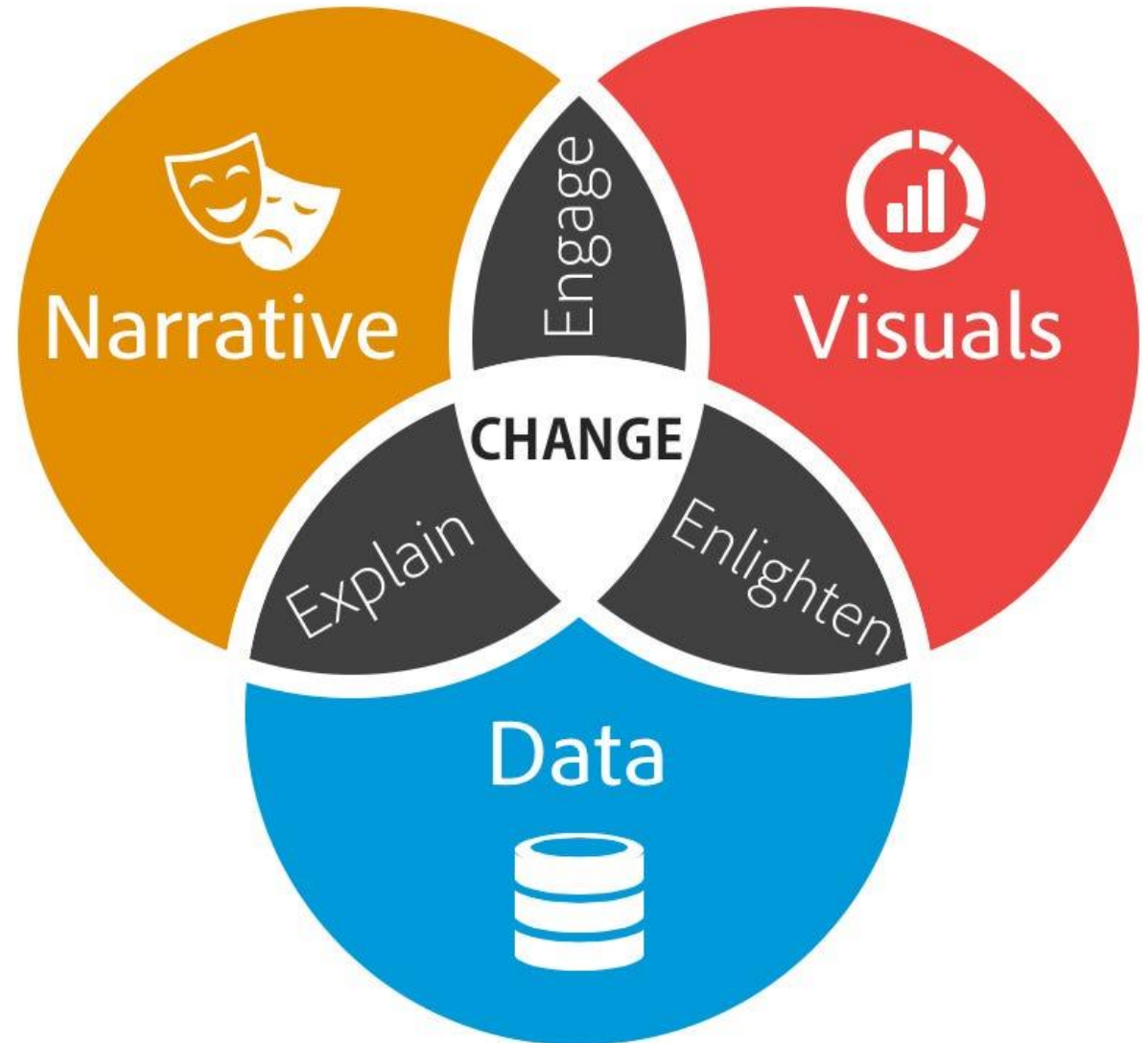
Based on survey of 100 students conducted before and after pilot program (100% response rate on both surveys).

Three key elements of effective communication



Driving change

Only a combination of right data, visuals and narrative can influence and drive change.



Ideas worth spreading

Stories make up at least 65% of the content of the 500 most popular TED talks



David Quinalty, CC

“When it comes to inspiring people to embrace some strange new change in behavior, storytelling isn’t just better than the other tools. It’s the only thing that works”

- Steve Denning

Why put in the effort?

Reason and logic!

Crafting a story is effort!

Can't facts speak for themselves?

Shouldn't business decisions be based solely on logic and reason?

Emotional judgement

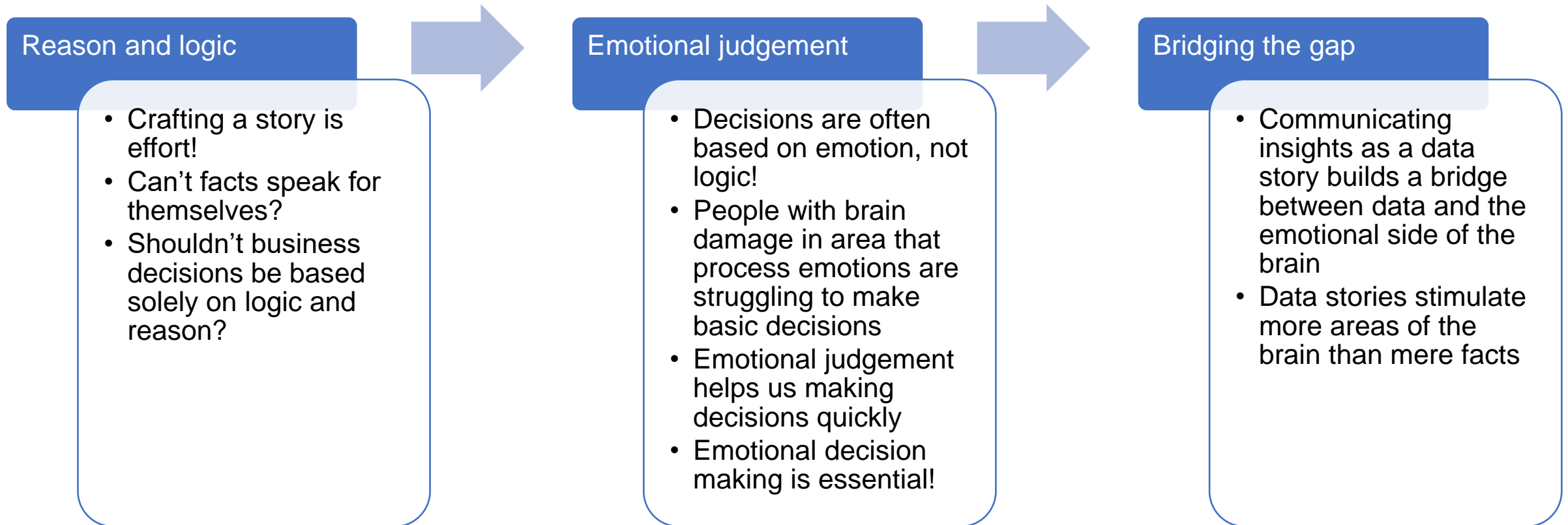
Decisions are often based on emotion, not logic!

People with brain damage in area that process emotions are struggling to make basic decisions

Emotional judgement helps us making decisions quickly

Emotional decision making is essential!

Can't we just present the facts?



Memorability

65%

Remember **stories**

5%

Remember **statistics**

Source: Stanford study by Prof. Chip Heath

Persuasiveness

\$2.38

Story-based handout

\$1.14

Infographic handout

Average donations in Save the Children
campaign

Engagement

People who listen to a story want to hear the end

We tend to suspend disbelief in order to be entertained

People who listen to statistics nitpick over details

We're inclined to suspend belief in order not to be fooled

The tragic story of Ignaz Semmelweis

Ignaz Semmelweis was a physician working in a Viennese hospital

He discovered that the doctor-led clinic had a higher mortality than the midwife-led clinic

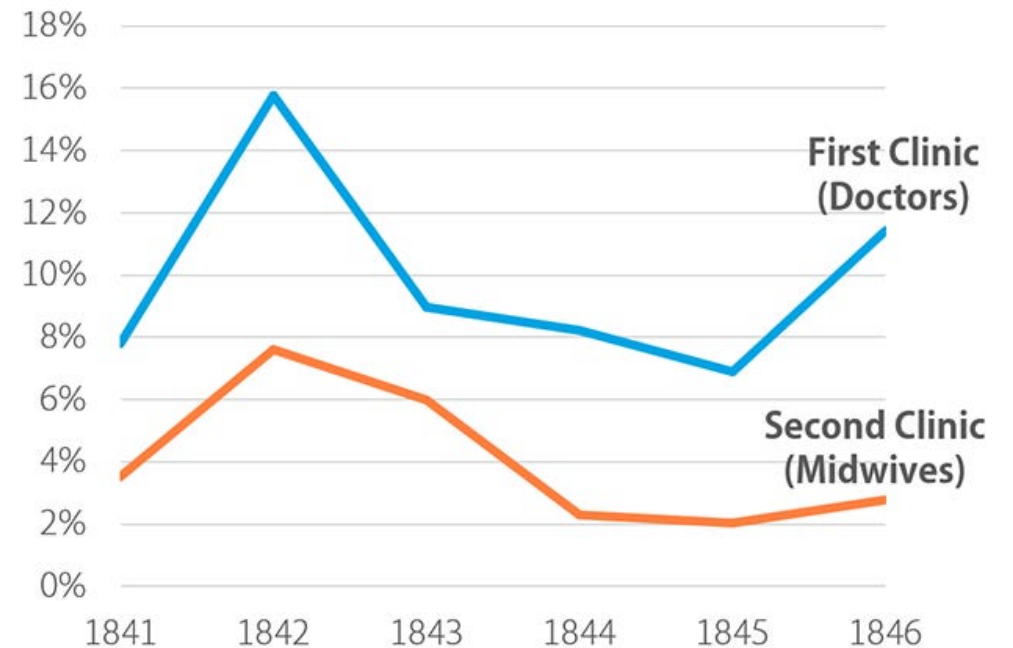
A close friend of Semmelweis died after being poked by a student's scalpel at an autopsy

Semmelweis noticed a similarity in his friend's pathology

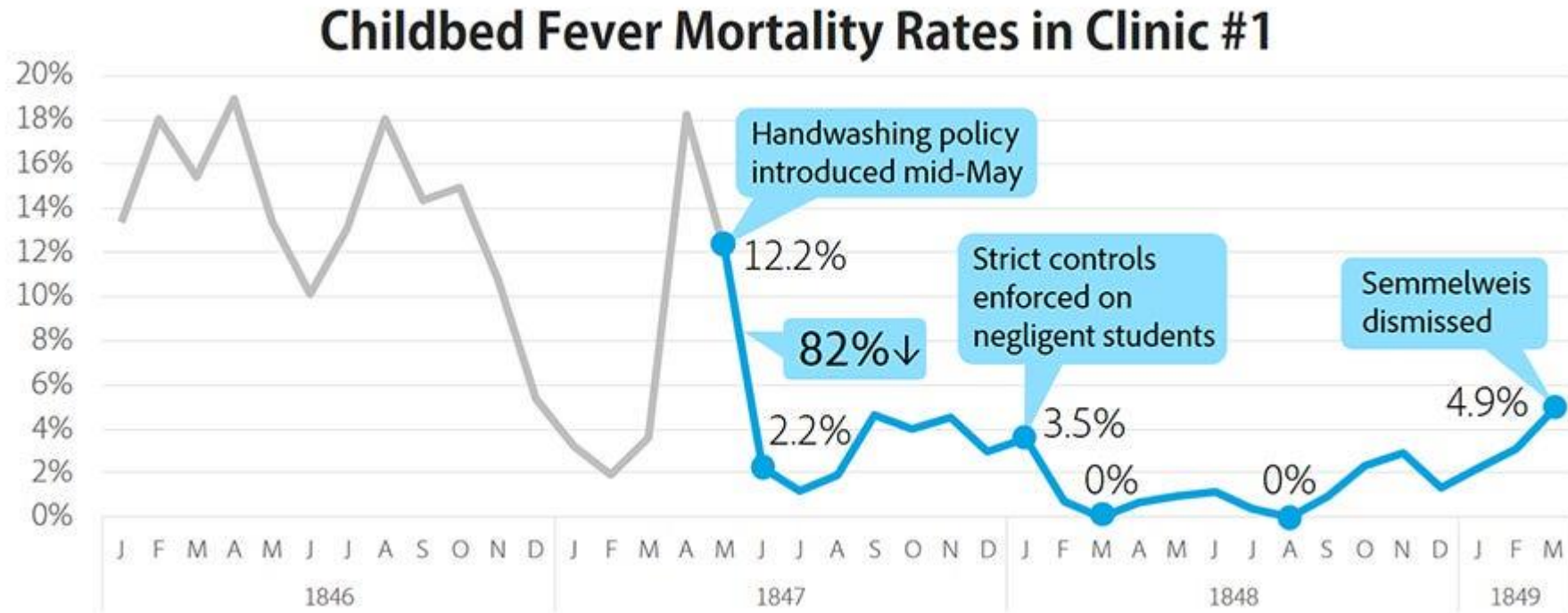
Doctors would perform autopsies in the morning and attend patients in the afternoon

Midwives were not in contact with corpses

Childbed Fever Mortality Rates



The tragic story of Ignaz Semmelweis



Introducing handwashing policy reduced mortality by **82%**!

The tragic story of Ignaz Semmelweis

Ignaz Semmelweis couldn't explain why his handwashing policy worked

Germ theory would only be developed later by Louis Pasteur

Ignaz Semmelweis faced sharp criticism, ridicule and resistance from established doctors

His position in Vienna was not renewed

He died in a mental asylum – succumbing to an infected wound inflicted by the asylum's guards



What can we learn?

Timeliness and clarity

- Semmelweis took 14 years to publish findings
- Until then, discovery was shared by colleagues and students and often misrepresented

Audience and the Curse of Knowledge

- Semmelweis couldn't understand why anyone wouldn't follow his advice
- He failed to understand his audience and their belief

Narrative evokes emotion

- Semmelweis failed to tell a story with his data
- He assumed that data was enough to convince anyone

The power of data visualisation

- Semmelweis failed to visualise his numbers
- He relied primarily on data tables

Anatomy of a story

Elements of a Story

Beginning

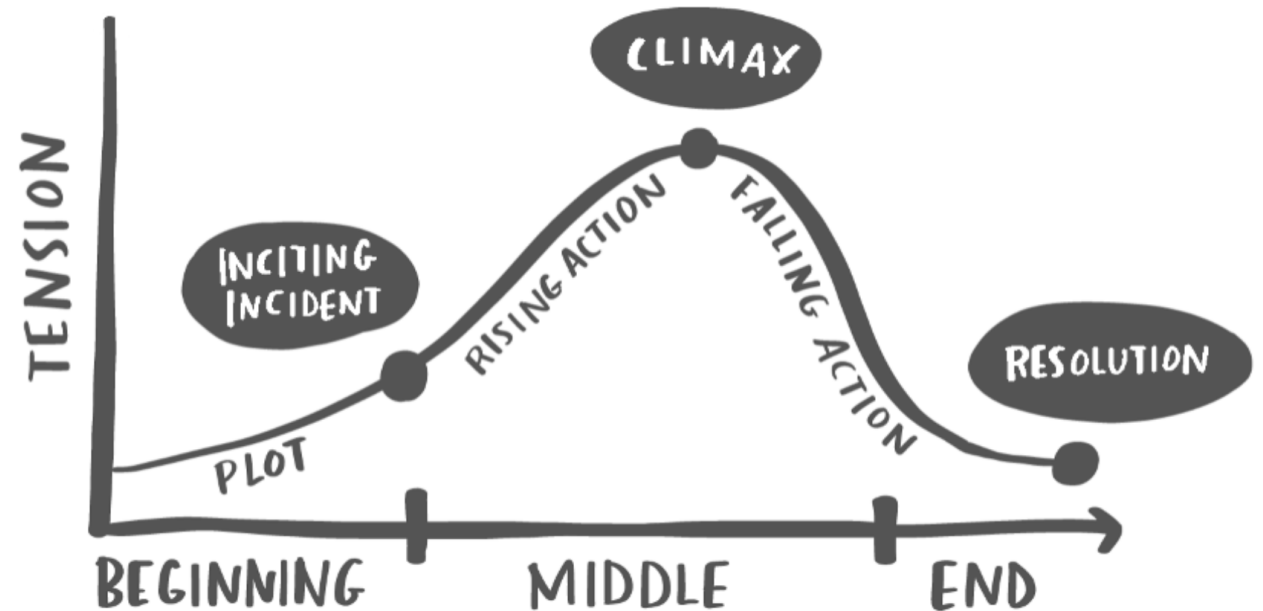
- Introduce plot
- Build context
- Why?

Middle

- Examples
- Demonstrate problem
- What could happen without action

End

- Call to action
- What do you want the audience to do?

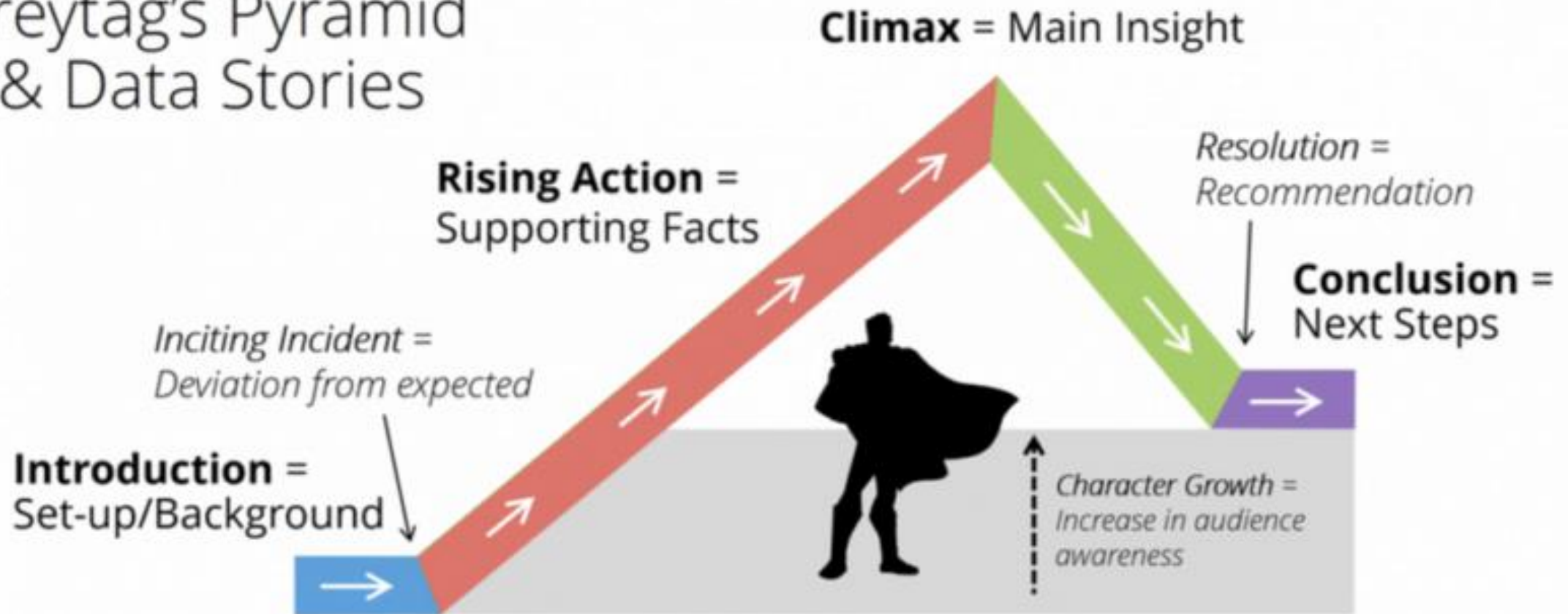


Knafllic, Cole. *Storytelling With Data: Let's Practice!* Wiley, © 2019.

Illustration by Catherine Madden.

Freytag's Pyramid

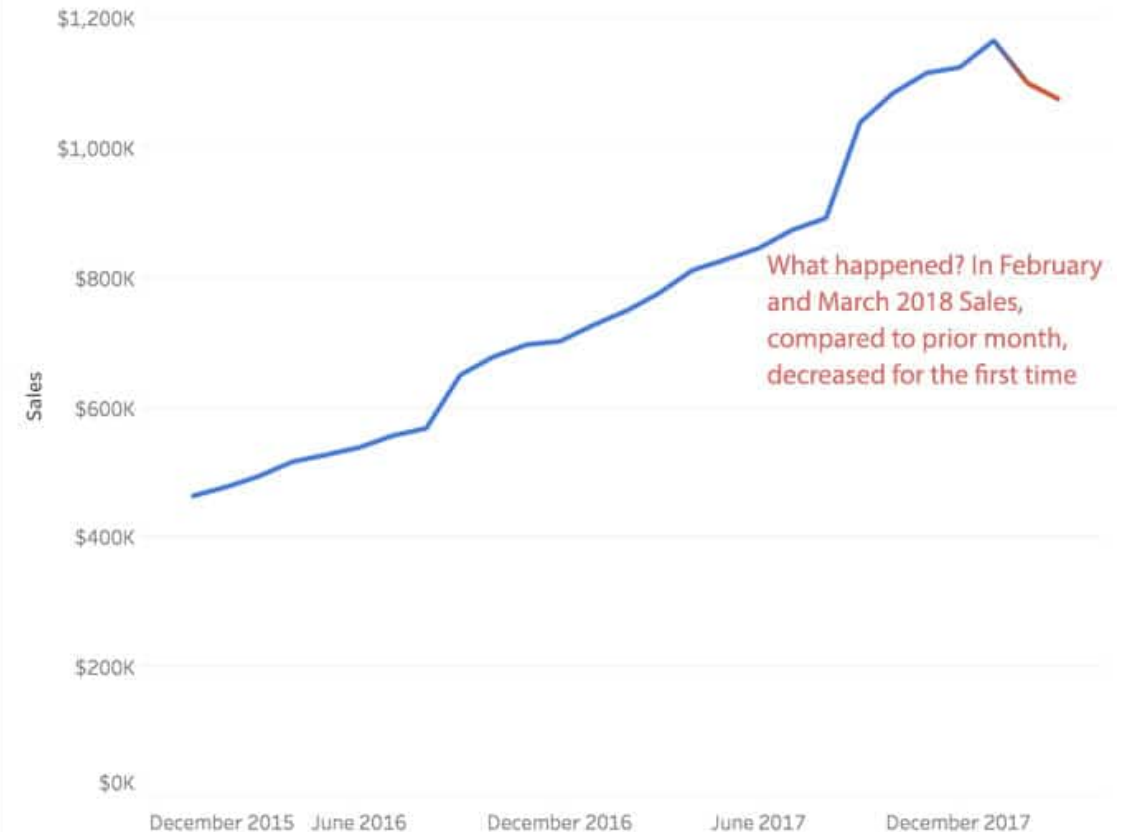
Freytag's Pyramid & Data Stories



Step 1: Set Up

“For the first time in our company’s history, Sales compared to the prior month decreased. This happened in both February and March of 2018. What happened?”

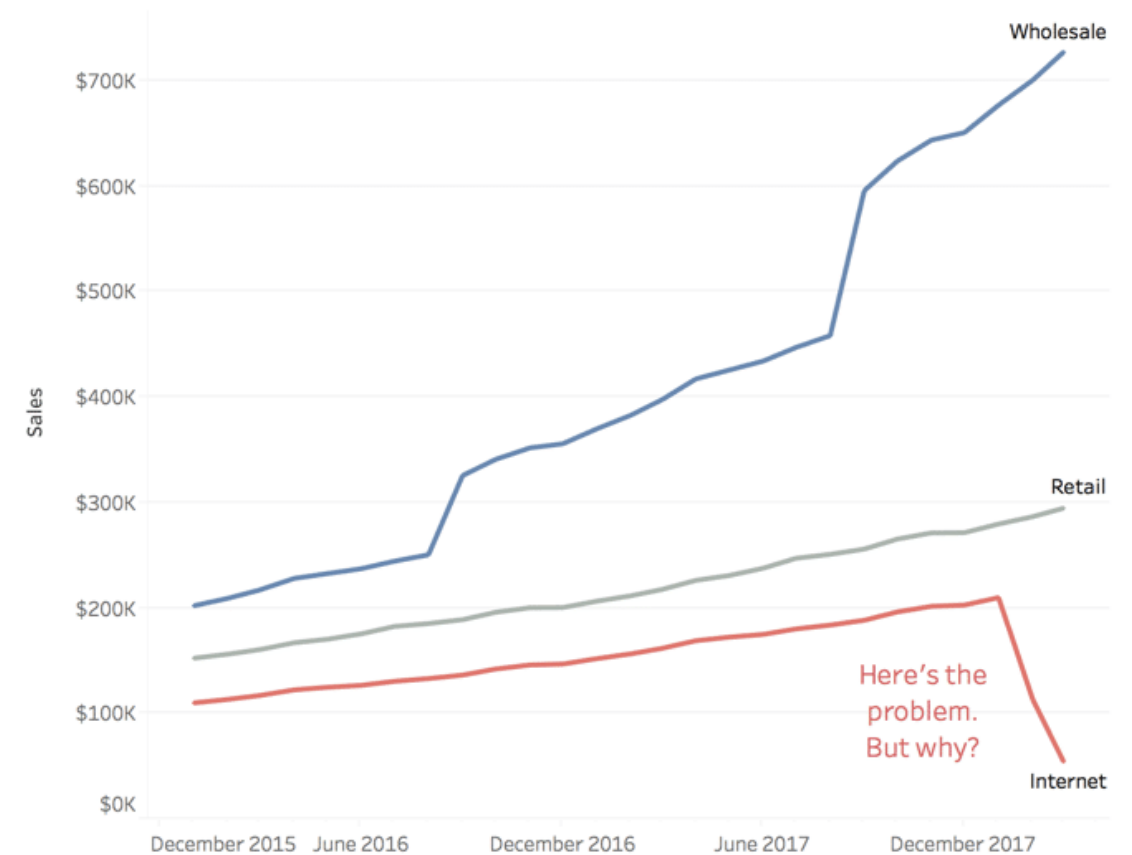
Why Have Sales Decreased for the First Time?



Step 2: Rising Insights

Insight 1: “To find out what happened to sales, we dug deeper, looking at Sales by Channel and found that Internet Sales showed a significant drop in both February and March 2018.”

How Are Sales by Channel Performing?



Step 2: Rising Insights

Insight 2: “But why did Internet Sales decrease?”

Looking at our web data, we found that customers were still coming to our web site, in fact sessions had increased at the same steady rate as the past.

However, we found Customer Shopping Carts were being abandoned at a very high rate starting in February 2018.”

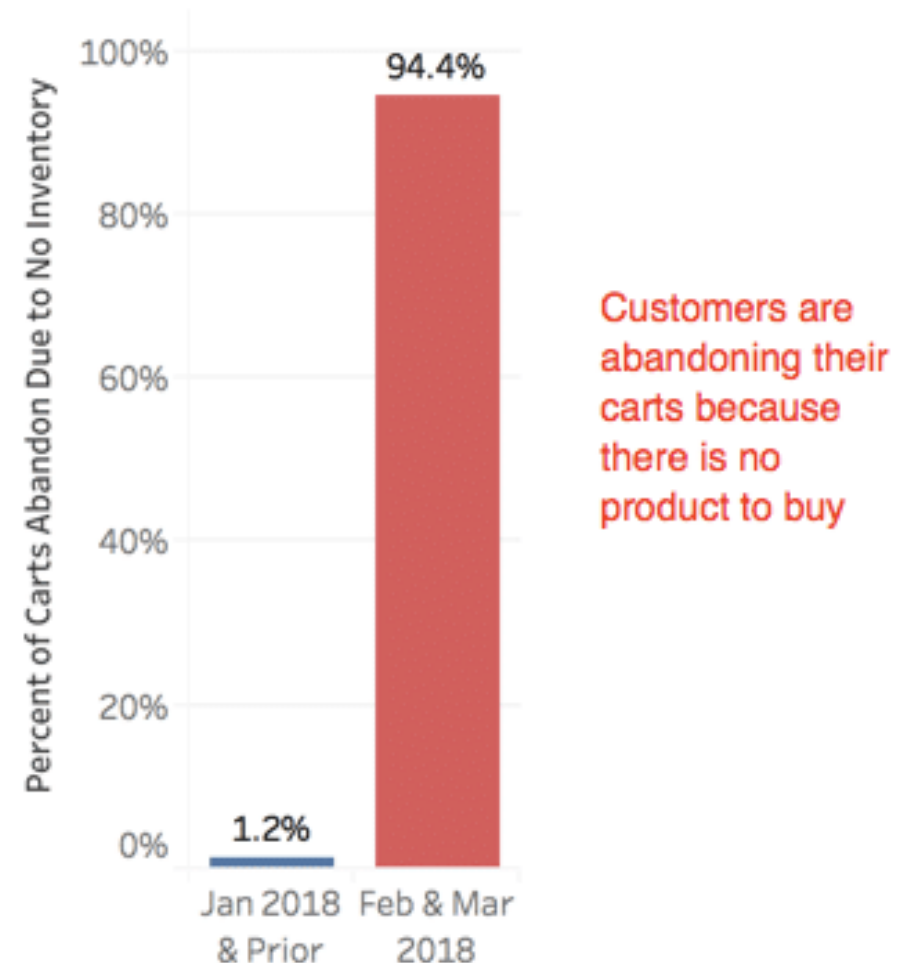
What is the Abandoned Cart Rate?



Step 3: Aha! Moment

“Why would customers, who were in the process of making a purchase, abandoned their carts? This was not occurring prior to February 2018. That’s when we discovered that approximately 94% of the shopping carts were being abandoned due to no inventory being on hand for the products in the cart! Customers can’t buy if we don’t have the product in stock. That is the cause of our decrease in sales.”

What Percentage of Carts Were Abandoned Due to No Inventory?



Step 4: The Solution

“We haven’t seen a decrease in sales, we’ve seen a decrease in our ability to stock the products our customers want to buy.”

As such, we recommend the following...

If we did the above, our sales through March 2018 would have continued our stellar month over month increase, which would look like the following:

How Would Sales Have Looked With the Solution Implemented?



Where to start?

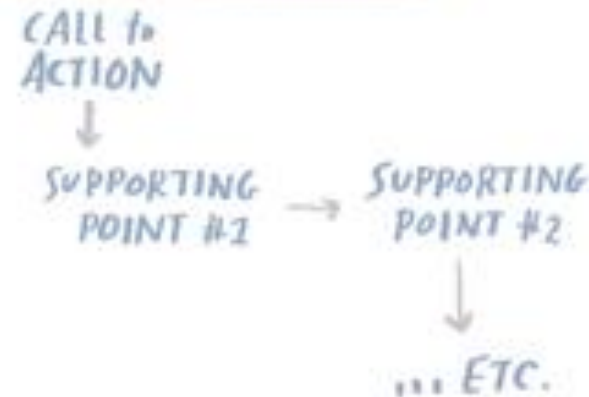
NARRATIVE FLOW

The ORDER of YOUR STORY ...
the PATH on which YOU TAKE YOUR AUDIENCE

CHRONOLOGICAL



LEAD with the ENDING



Types of data stories

Change over time

Drill Down

Zoom Out

Contrast

Intersections

Factors

Outliers

What it does: Uses a chronology to illustrate a trend.

Discussions it starts: Why did this happen, or why does it keep happening? What can we do prevent or make this happen?

https://help.tableau.com/current/pro/desktop/en-us/story_best_practices.htm

Arsenal's Injury Crisis

Players have suffered nearly 900 injuries in 12 years and
Arsene Wenger has admitted he does not understand why

** Study only includes teams that have been in the EPL every year since the 2002-03 season through 12 October 2014*

<

Arsenal have been accumulating injuries at a staggering rate

Season after season Arsenal dominate the injury table

Meanwhile, Arsenal's rivals suffer much fewer injuries

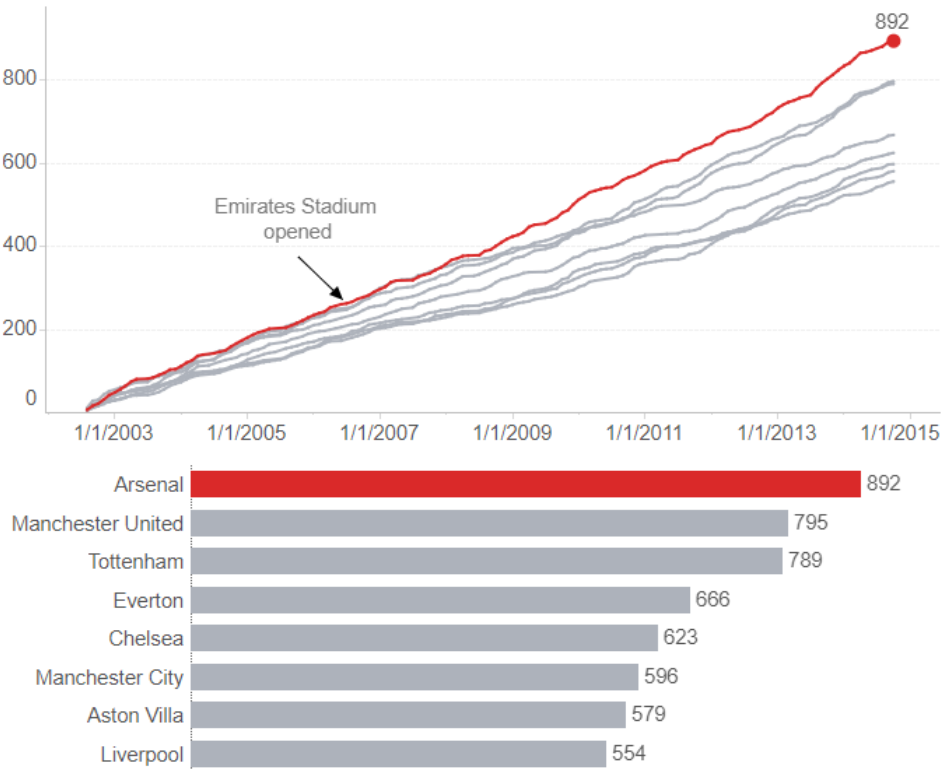
Arsenal have had 440 hamstring, knee, foot & ankle injuries

Perhaps the pitch at Emirates Stadium is to blame

Arsenal have had 4 players with 10 or more injuries

>

Cumulative injuries suffered since July 2002



Types of data stories

Change over time

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What it does: Sets context so that your audience better understands what's going on in a particular category.

Discussions it starts: Why is this person, place or thing different? How does the performance of this person, place, or thing compare?

https://help.tableau.com/current/pro/desktop/en-us/story_best_practices.htm

Drill down

Tell me about Will

1 year of data of phone calls, SMSes and data sessions

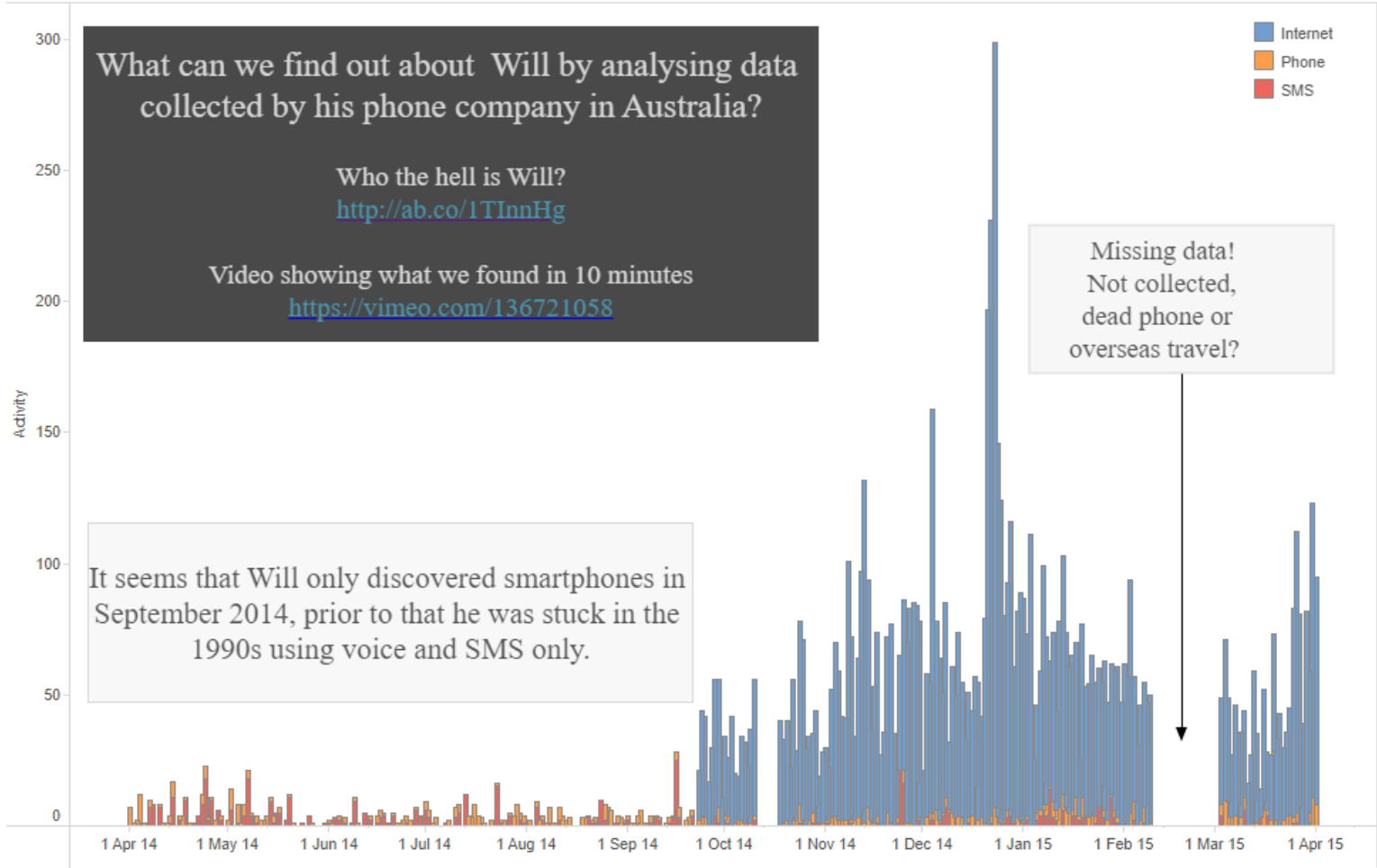
Will lives on Sydney's Northern Beaches near Balgowlah

He works in the city, but might work from home days

The gaps in the data are due to international travel

Will travelled to Tasmania 4 times last year, family visits

Who is Will talking to? SMS with friends voice calls for work



Types of data stories

Change over time

Drill Down

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Outliers

What it does: Describes how something your audience cares about relates to the bigger picture.

Discussion it starts: How does something you care about compare to the bigger picture? What effect does one area have on the bigger picture?

https://help.tableau.com/current/pro/desktop/en-us/story_best_practices.htm

Zoom out

Vancouver Cyclists



Types of data stories

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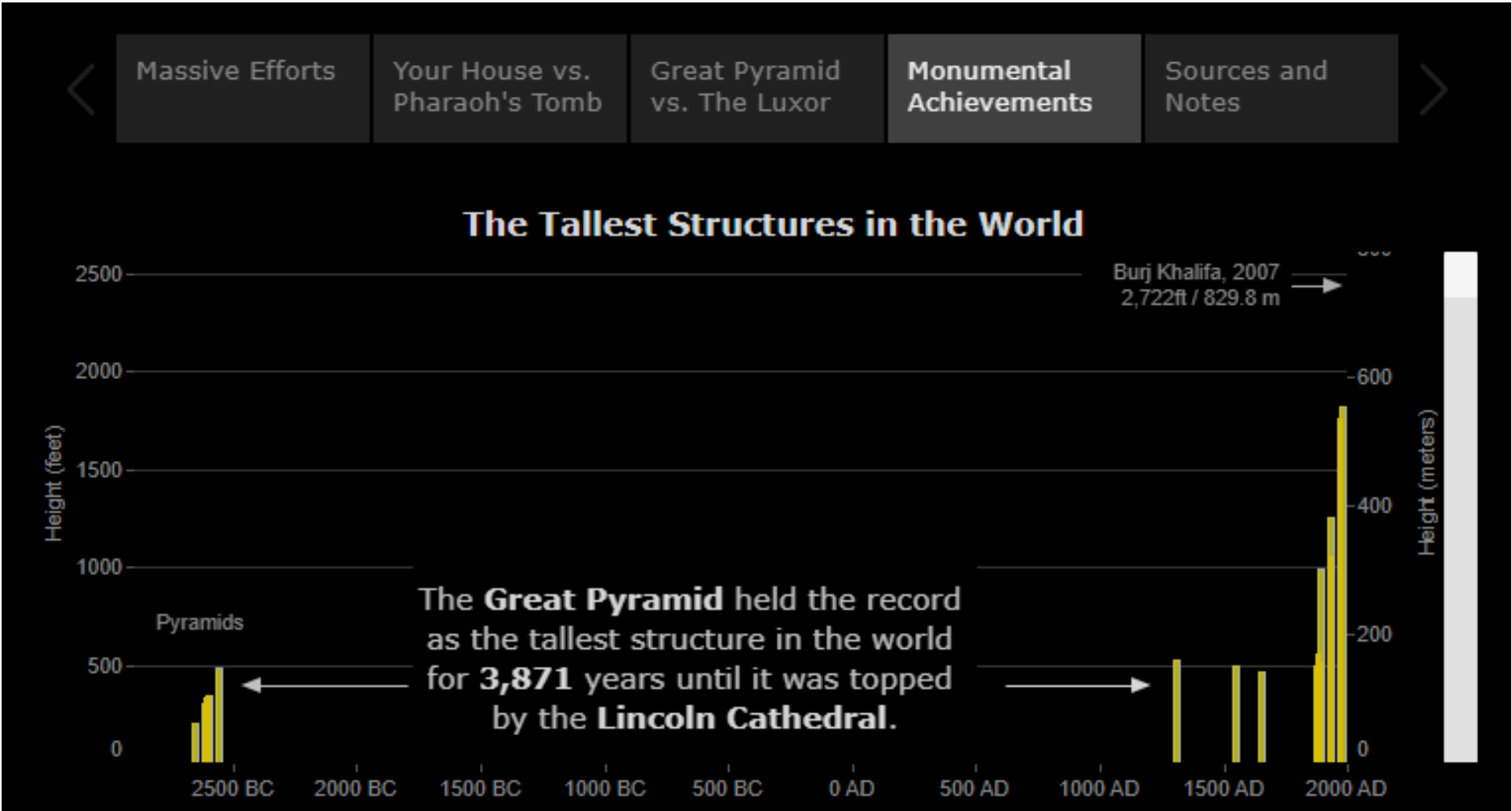
Factors

Outliers

https://help.tableau.com/current/pro/desktop/en-us/story_best_practices.htm

What it does: Shows how two or more subjects differ.

Discussions it starts: Why are these items different? How can we make A perform like B? Which area should we focus on and which area is doing fine?



Types of data stories

Change over time

Drill Down

Zoom Out

Contrast

Intersections

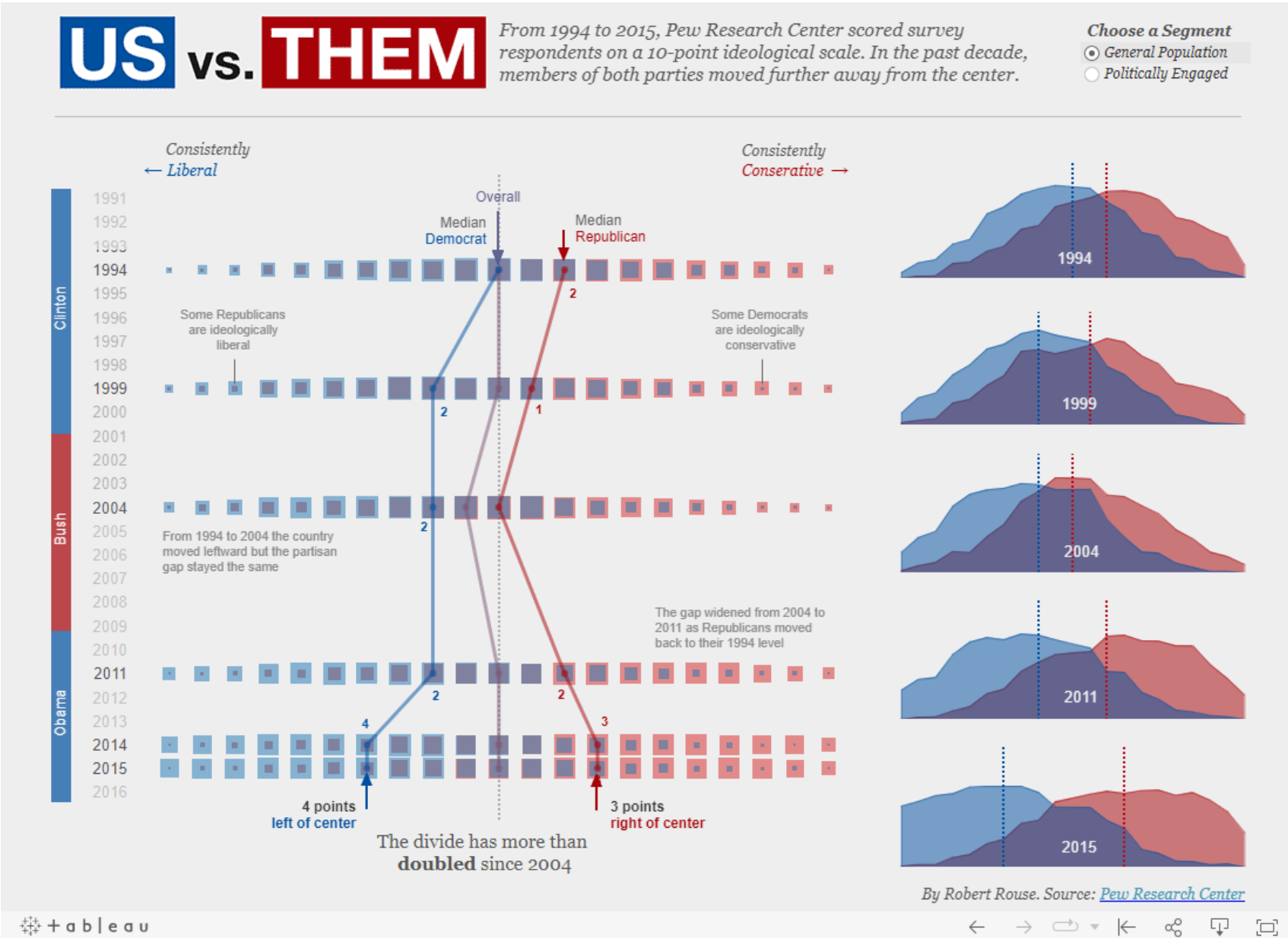
Factors

Outliers

What it does: Highlights important shifts when one category overtakes another.

Discussions it starts: What causes these shifts?
Are these shifts good or bad? How do these shifts affect other aspects of our plan?

https://help.tableau.com/current/pro/desktop/en-us/story_best_practices.htm



Types of data stories

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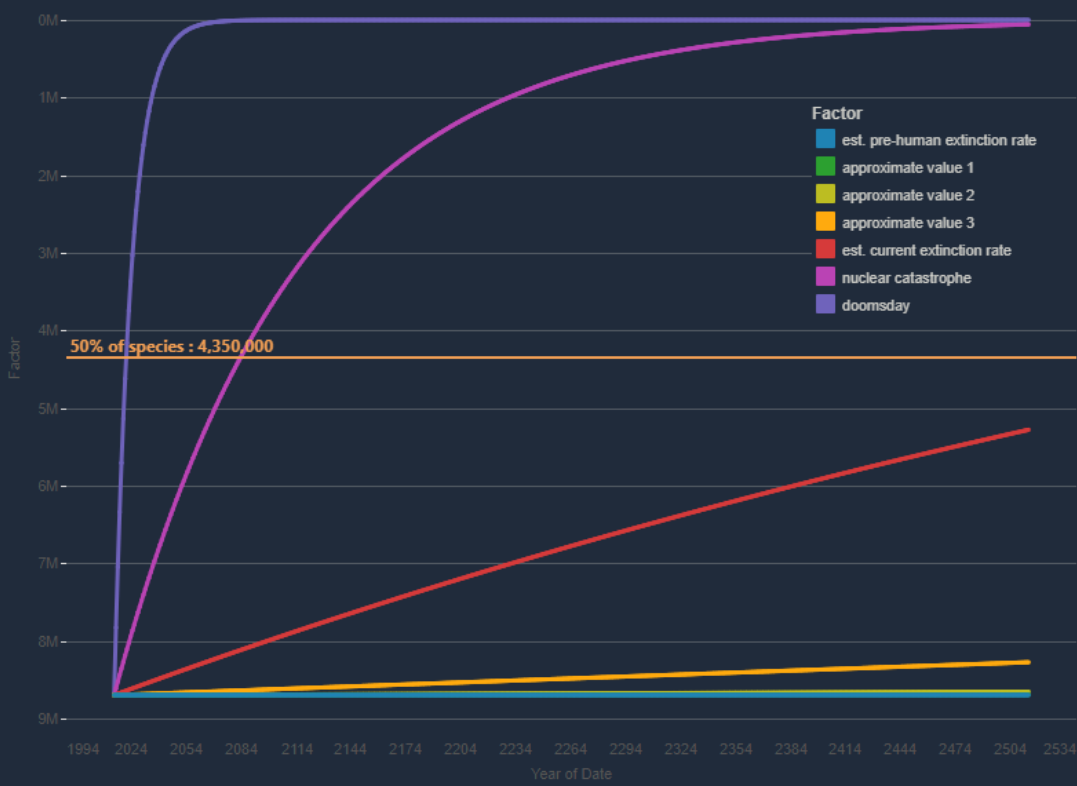
Outliers

What it does: Explains a subject by dividing it into types or categories.

Discussions it starts: Is there a particular category we should focus on more? How much do these items affect the metric we care about?

https://help.tableau.com/current/pro/desktop/en-us/story_best_practices.htm

In only 500 years from now,
humankind will have exterminated
approx. 40% of all species on this planet



© by Steph Baranya - Aka The Amazing Data Fan
(This Workbook was Created for the Internal Silver Belt Certification - Tableau Software Germany)

Types of data stories

Change over time

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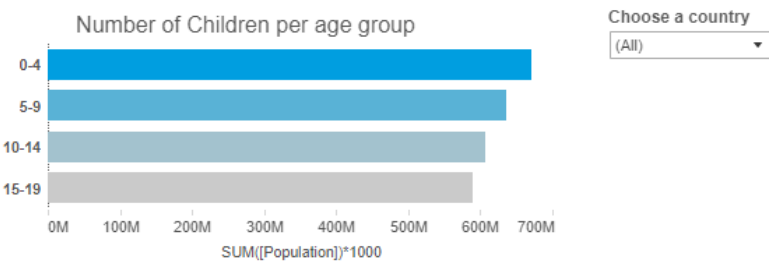
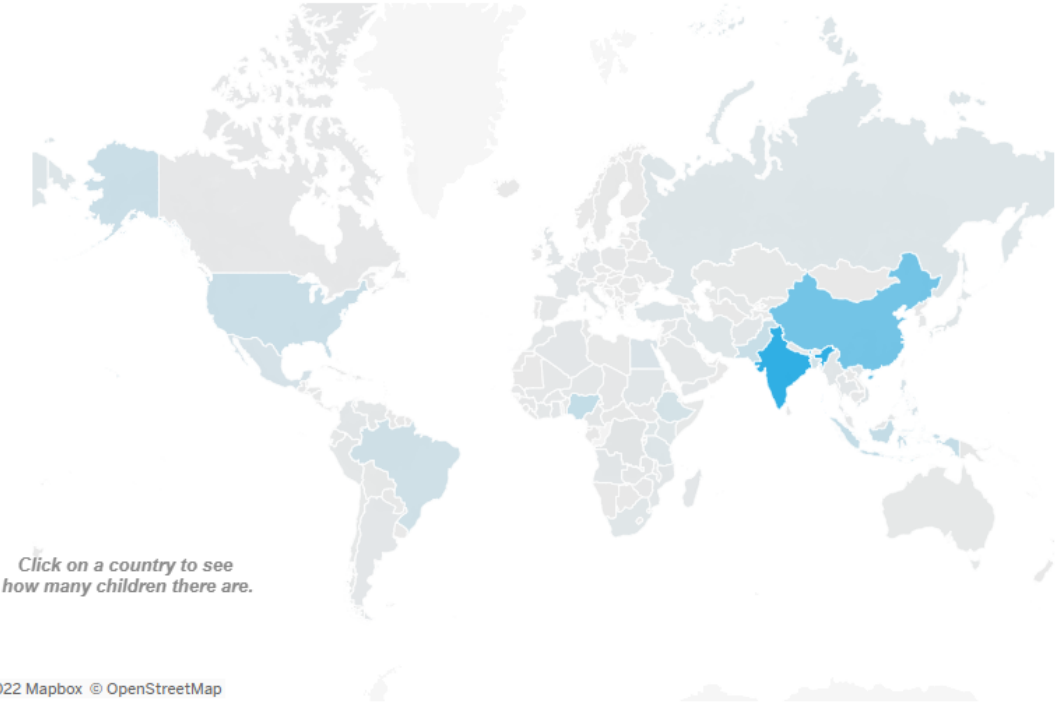
What it does: Shows anomalies or where things are exceptionally different.

Discussions it starts: Why is this item different?

https://help.tableau.com/current/pro/desktop/en-us/story_best_practices.htm



Of course not, Santa is crazy busy - and fast!



Give your visualisations a makeover!

—

Give your visualisations a makeover!

Context

Appropriate Display

Eliminate Clutter

Draw Attention

Design

Story

From: *Storytelling with data*, pp. 187-189

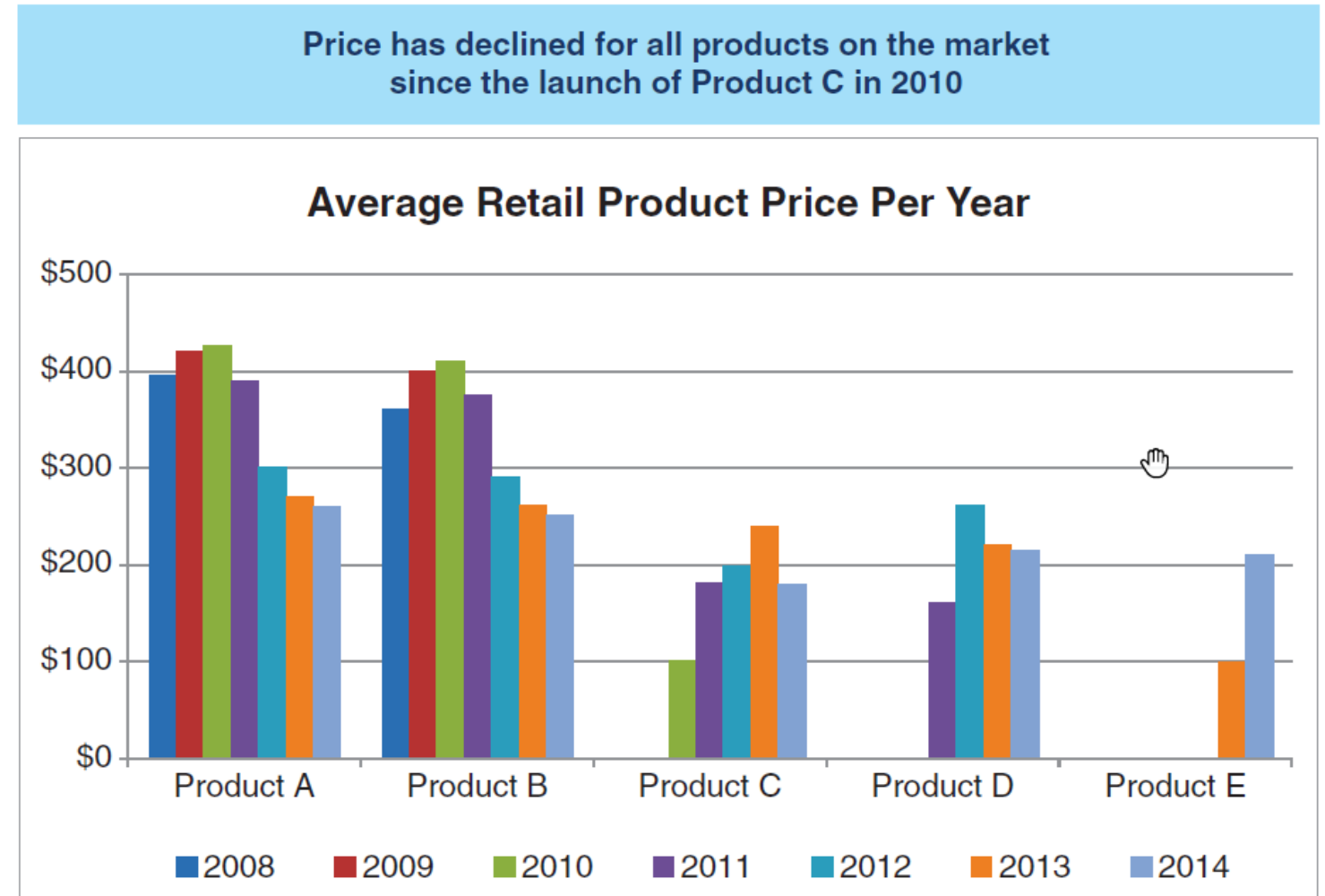


FIGURE 8.1 Original visual

Give your visualisations a makeover!

Context

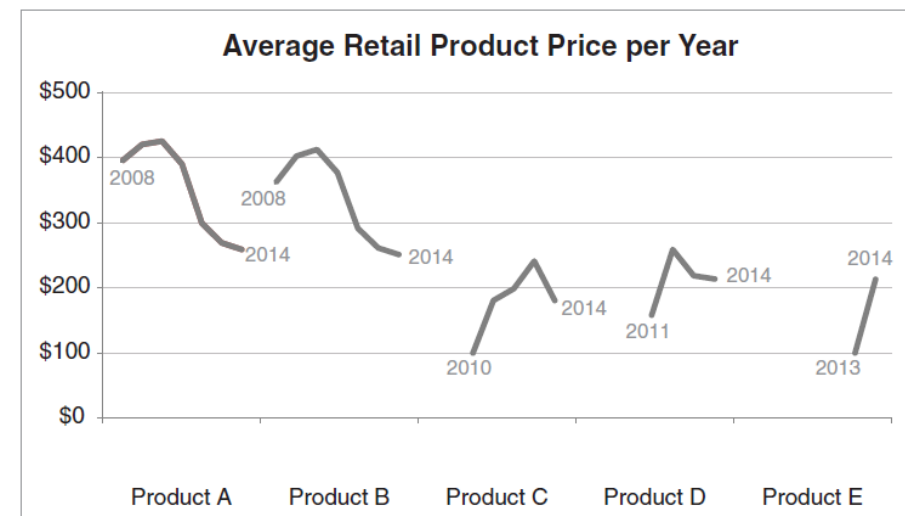
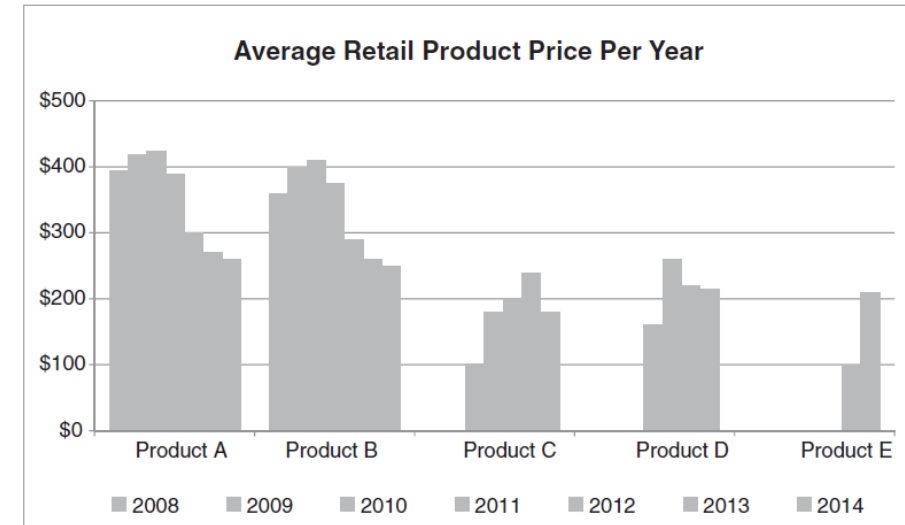
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Eliminate Clutter

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Give your visualisations a makeover!

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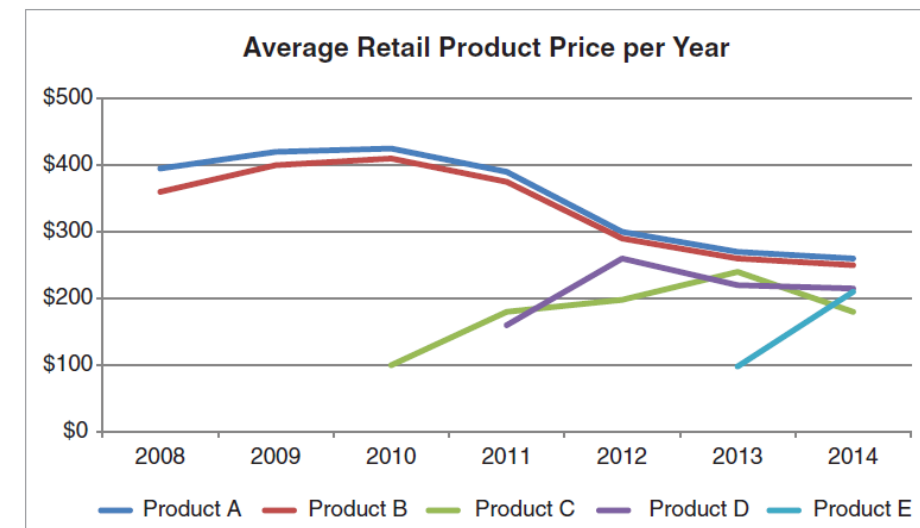
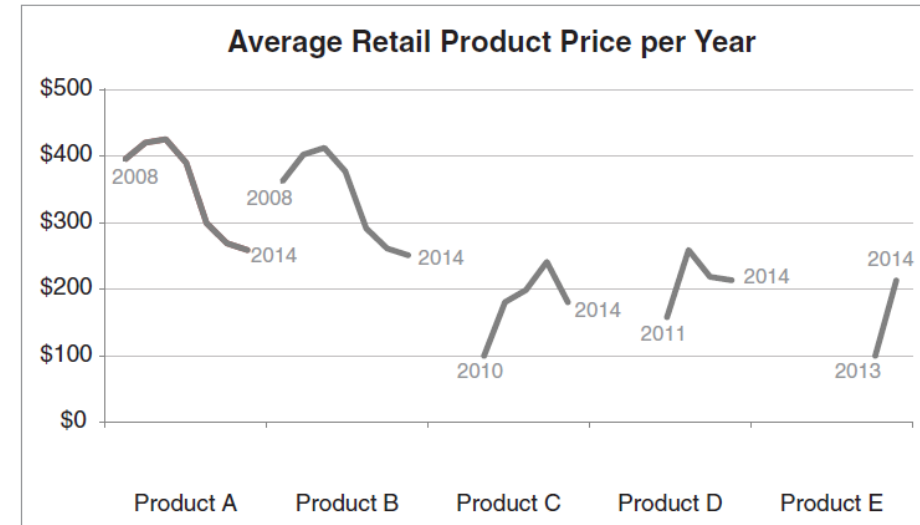
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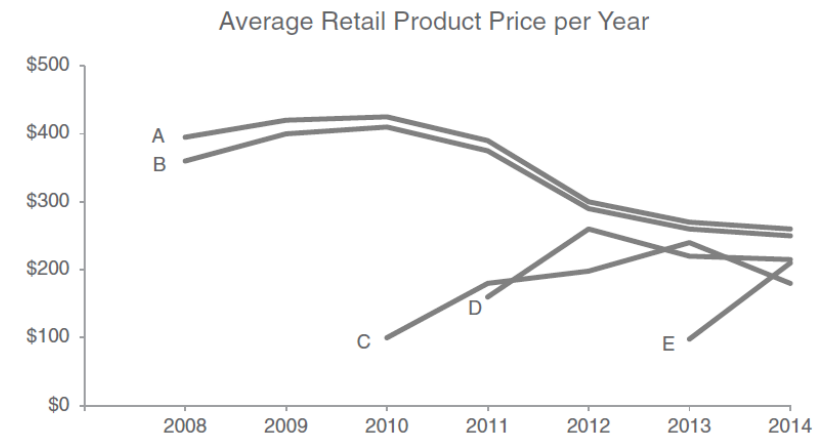
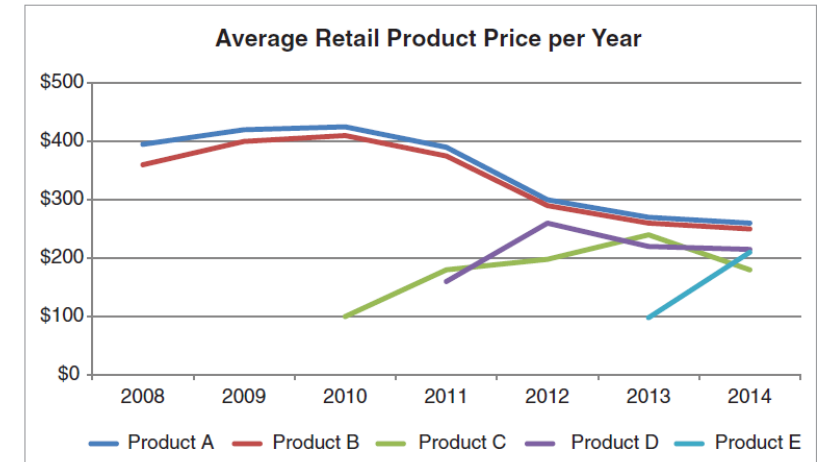
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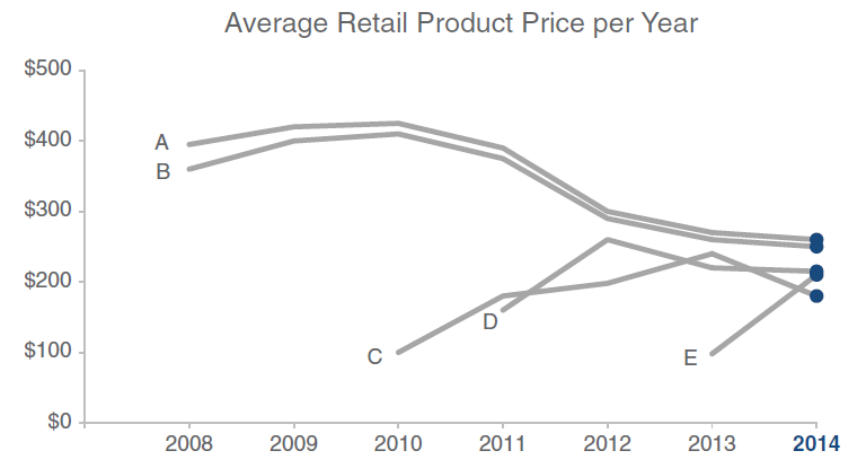
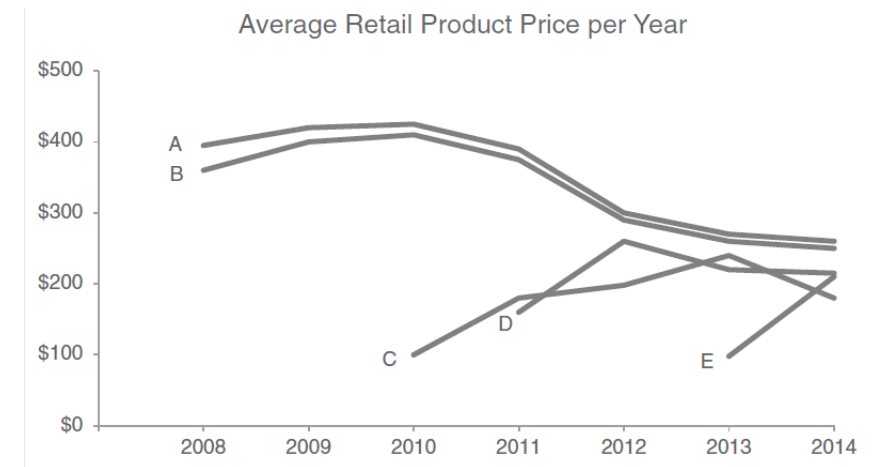
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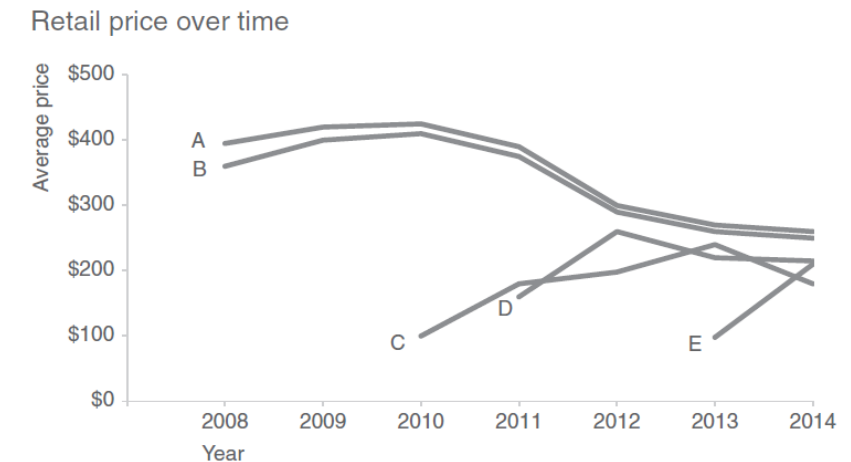
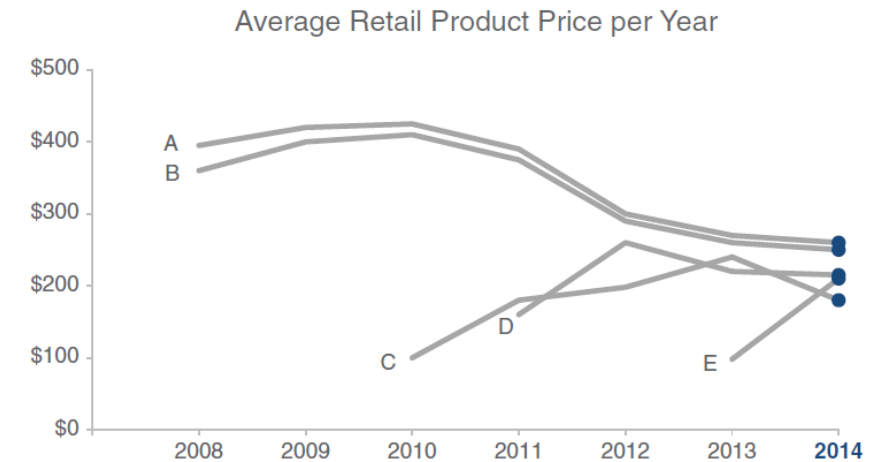
Appropriate Display

Eliminate Clutter

Draw Attention

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Story



Give your visualisations a makeover!

Context

Appropriate Display

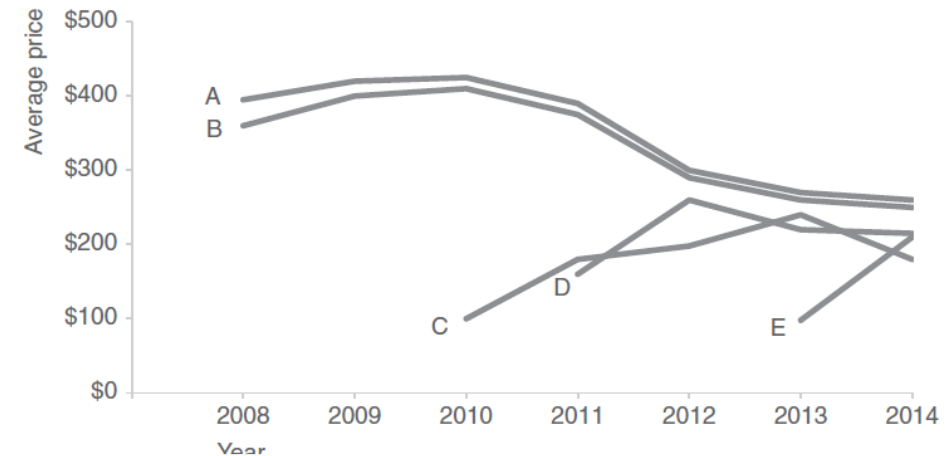
Eliminate Clutter

Draw Attention

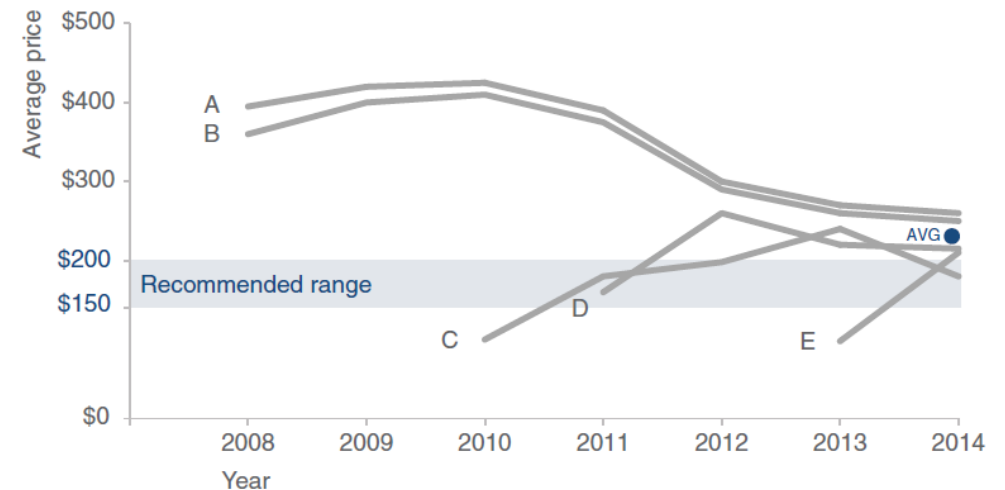
Design

Story

Retail price over time



Retail price over time



Further Reading

Storytelling with data. Knafllic, Cole Nussbaumer, 2015. Hoboken, New Jersey : Wiley; 1st edition
ISBN: 1119002257