Storytelling with Data

Philosophies of Communication

Facts

Stories

Why?
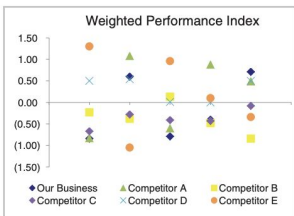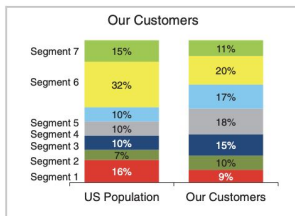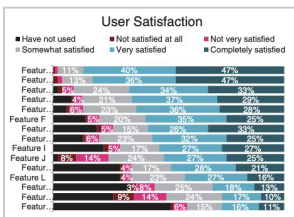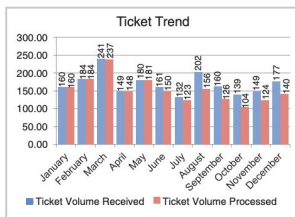
The Need for the session

The Need
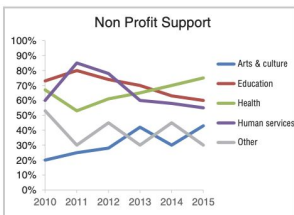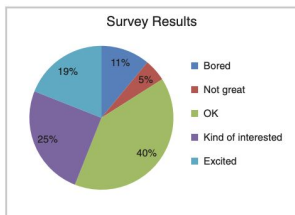
Bad graphs are everywhere! **Humans are not naturally good at storytelling.**

1

The Importance of Context

Know the Outcome

Knowing what the **desired outcome** is _before_ you start preparing the communication is critical for **structuring** it well.

Exploratory vs Explanatory	Always know the difference between exploratory versus explanatory analysis with respect to your problem statement. Depending on the audience, know which analysis to present.
The 3-minute story	if you had only three minutes to tell your audience what they need to know, what would you say?
The Big Idea/Elevator Pitch	if you had only a single sentence to tell your audience what they need to know, what would you say?

The Big Three Questions

Who?

- **Audience:** Who the audience is, their knowledge level about the subject matter, and their relationship to you (senior or junior)?

- **You:** Is your credibility as an expert established, or will that be validated as you present the story?

What?

- **Action:** What action do you want the audience to take? Always dictate an action, or, at least, inform a list of possible strategic actions.

- **Mechanism:** What is the mode of communication?

How?

- **Evidence:** How do I make the point I want to make/action I want to suggest (the central theme of the story) with the data that is available?

2

Choosing an Effective Visual

Simple Text

STP Rate vs. Year
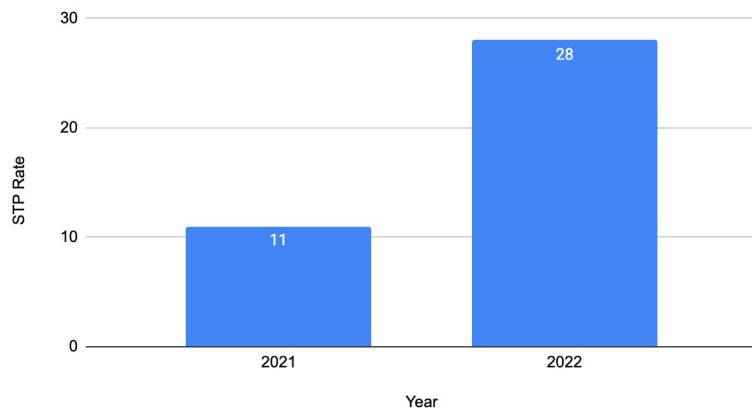
2.5 times

the increase in the STP rate in one year since the introduction of new measures

Tables

Date	Jobs	Fail Rate
2022-10-12	832	1.08%
2022-10-13	321	8.09%
2022-10-14	1068	2.34%

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Heatmaps

Country Level Sales Rank Top 5 Drugs

Rainbow distribution in color indicates sales rank in given country from #1 (red) to #10 or higher (dark purple)

Country	A	B	C	D	E
AUS	1	2	3	6	7
BRA	1	3	4	5	6
CAN	2	3	6	12	8
CHI	1	2	8	4	7
FRA	3	2	4	8	10
GER	3	1	6	5	4
IND	4	1	8	10	5
ITA	2	4	10	9	8
MEX	1	5	4	6	3
RUS	4	3	7	9	12
SPA	2	3	4	5	11
TUR	7	2	3	4	8
UK	1	2	3	6	7
US	1	2	4	3	5

Top 5 drugs: country-level sales rank

RANK	1	2	3	4	5+

COUNTRY I DRUG	A	B	C	D	E
Australia	1	2	3	6	7
Brazil	1	3	4	5	6
Canada	2	3	6	12	8
China	1	2	8	4	7
France	3	2	4	8	10
Germany	3	1	6	5	4
India	4	1	8	10	5
Italy	2	4	10	9	8
Mexico	1	5	4	6	3
Russia	4	3	7	9	12
Spain	2	3	4	5	11
Turkey	7	2	3	4	8
United Kingdom	1	2	3	6	7
United States	1	2	4	3	5

Scatterplots
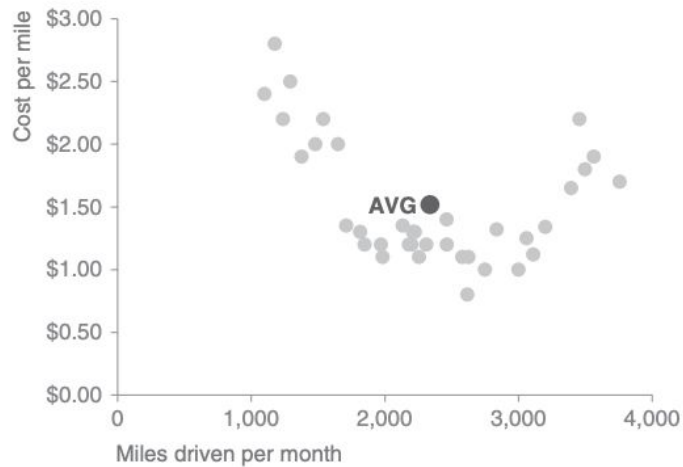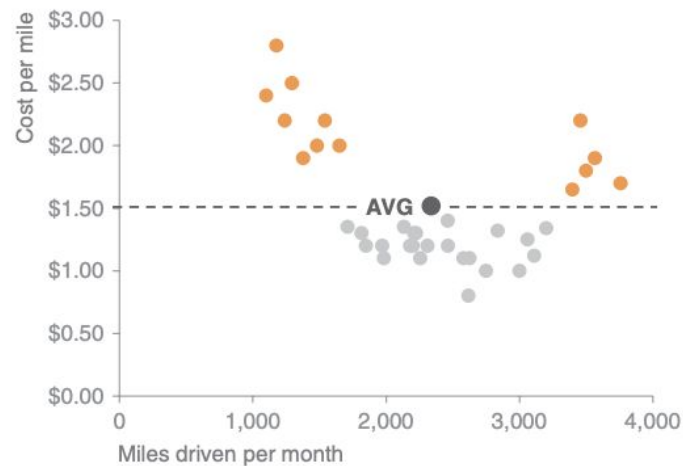
Line charts

Ticket volume over time

2 employees quit in May. We nearly kept up with incoming volume in the following two months, but fell behind with the increase in Aug and haven't been able to catch up since.

Number of tickets

Received: 202, 160, 139, 149, 177

Processed: 156, 126, 104, 124, 140

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2014

13
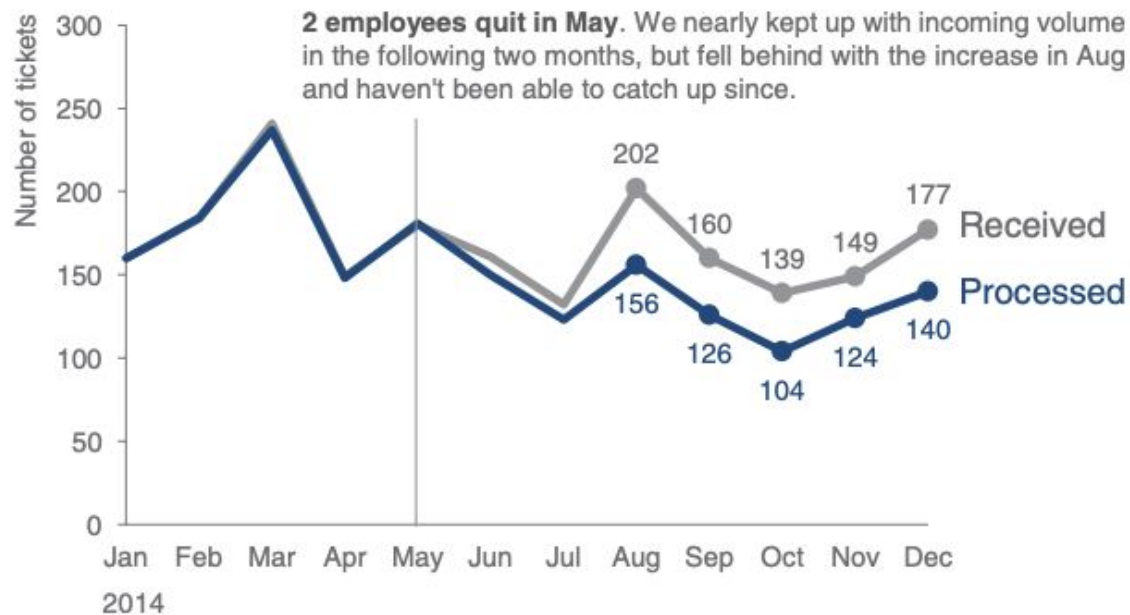
Barcharts

Comparing **these** is easy

Comparing **these** is hard
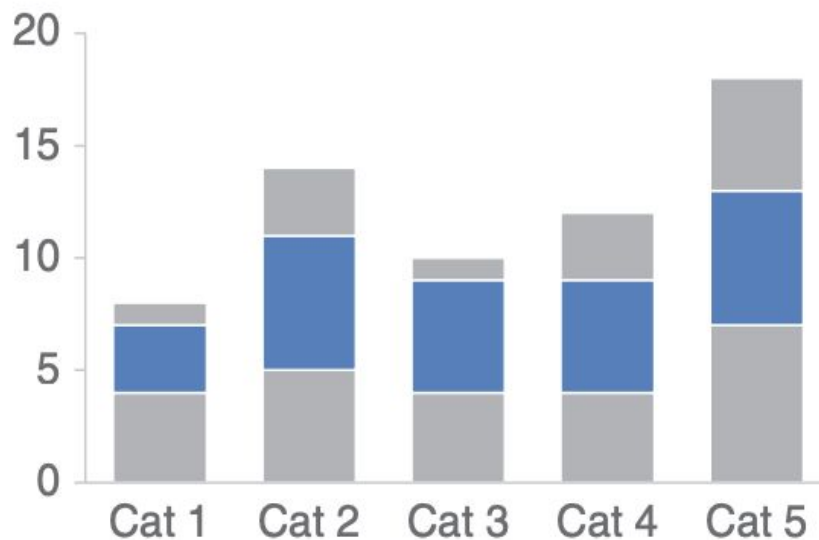
Pie charts are evil

Supplier Market Share

- Supplier A
- Supplier B
- Supplier C
- Supplier D
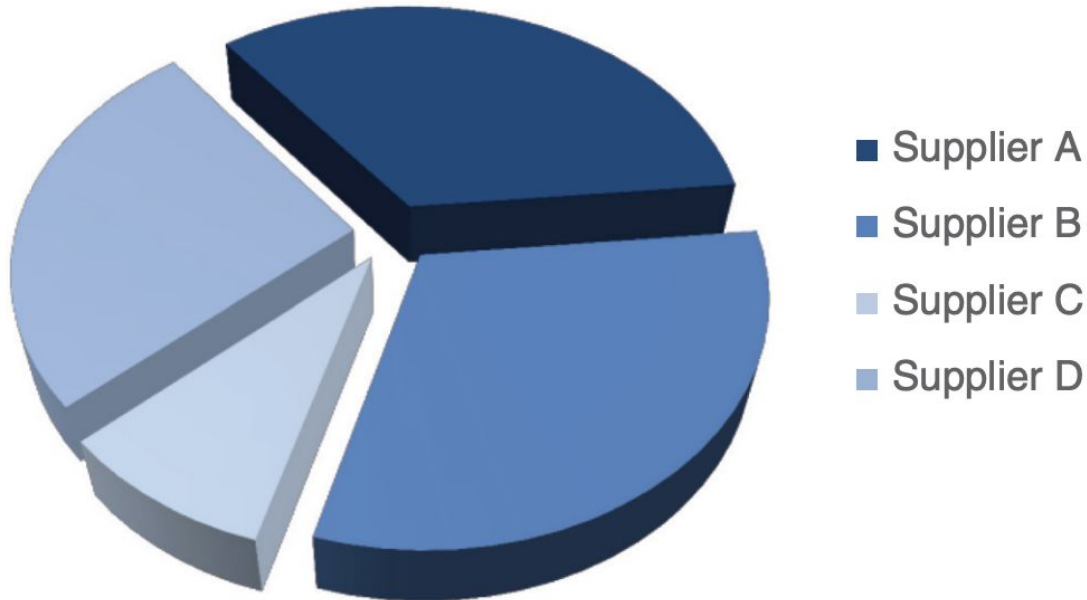
Which supplier is the largest based on this visual—what would you say?

Choosing an effective visual

- In many cases, there isn't a single correct visual display; rather, often there are different types of visuals that could meet a given need.
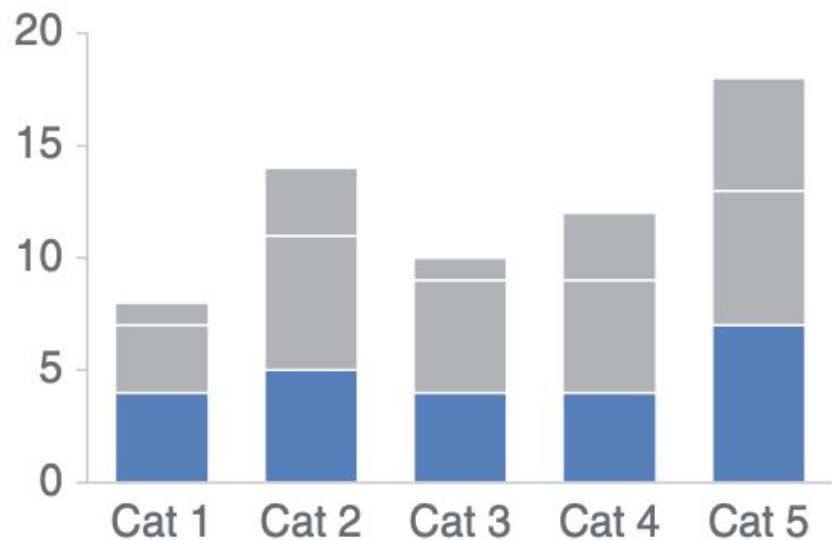
- If you're wondering 'What is the right graph for my situation?' the answer is always the same: whatever will be easiest for you and your audience to read.

- Ask: where they focus, what they see, what observations they make, what questions they have.

3

Clutter

Clutter is your enemy!

Cognitive Load

- We experience cognitive load anytime we take in information. Cognitive load can be thought of as the mental effort that's required to learn new information.

- Humans' brains have a finite amount of this mental processing power.

- As designers of information, we want to be smart about how we use our audience's brain power.

- In general, we have to identify anything that isn't adding informative value—or isn't adding enough informative value to make up for its presence—and remove those things.

- What matters most when it comes to our visual communications is the **perceived cognitive load** on the part of our audience: how hard they believe they are going to have to work to get the information out of your communication. This is a decision they likely reach without giving it much (if any) conscious thought, and yet it can make the difference between getting your message across or not.

What is clutter?

- The biggest cause of perceived cognitive load is clutter!

- These are visual elements that take up space but don't increase understanding.

- Clutter can make something feel more complicated than it actually is.

- When our visuals feel complicated, we run the risk of our audience deciding they don't want to take the time to understand what we're showing, at which point we've lost our ability to communicate with them. This is not a good thing.

Gestalt Principles to reduce Visual Clutter

PROXIMITY
When objects placed together, the eye perceives them as a group.

SIMILARITY
When objects look similar to one another, the eye perceives them as a group or pattern.

CONTINUANCE
The eye is compelled to move from one object through another.

CLOSURE
When an object is incomplete or not completely enclosed.

FIGURE & GROUND
When the eye differentiates an object from its surrounding area.

A decluttered visual

Performance overview

■ Our business
■ Competitor A
■ Competitor B
■ Competitor C
■ Competitor D
■ Competitor E

Weighted performance index | relative rank

Price — 1 of 6

Convenience — 2 of 6

Relationship — 4 of 6

Service — 6 of 6

Selection — 6 of 6
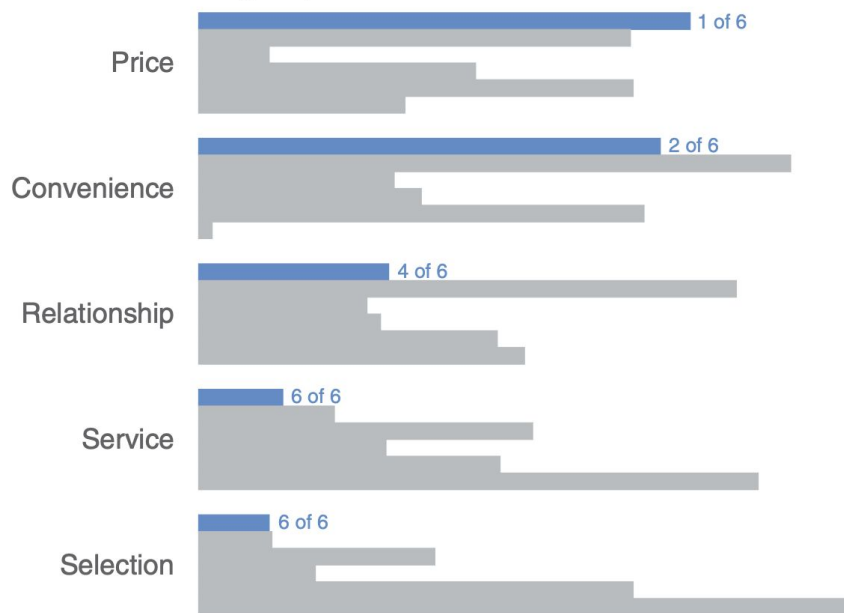
4

Focus your audience's attention

Preattentive attributes

7563950 68473

65866 3037576

860372658602

846589107830

How many 3 are there in this image?

75639**3**5068473

6586**3**0**3**7576

860**3**72658602

84658910783

How much time did you take to find the 3s now?

Other Attributes

- **Bold**

- Colour
- *Italics*
- Size

- Margin (spatial separation)

- <u>Underline</u>

5

Case Studies

Case Study 1: Hire 2 FTEs
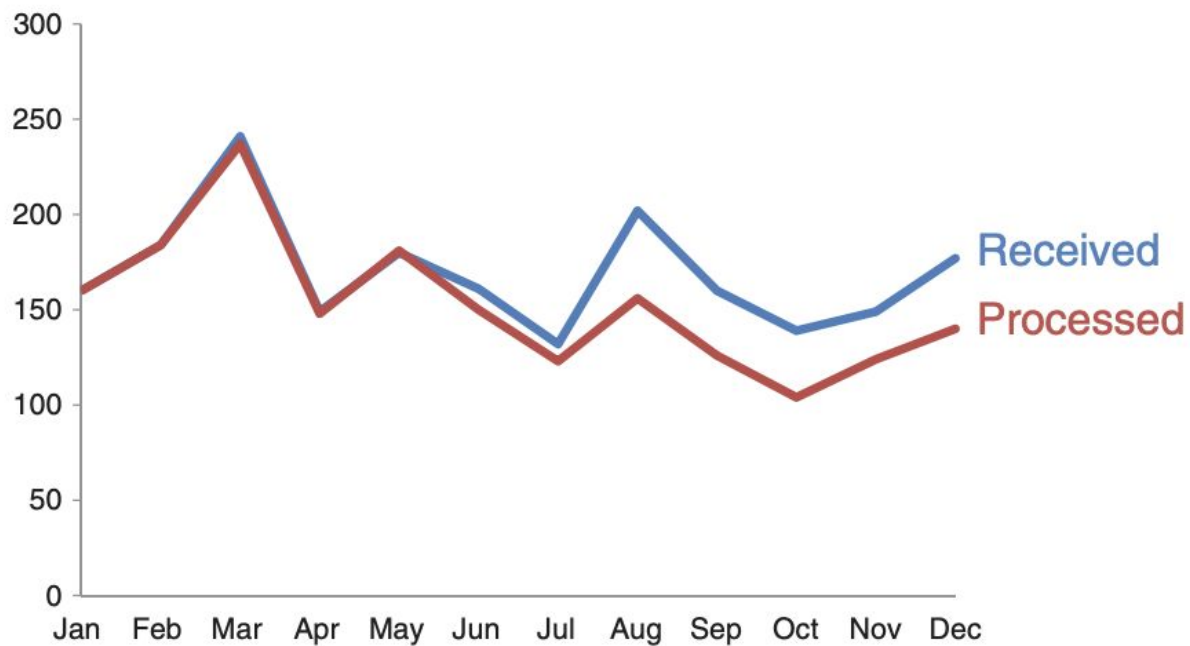
Case Study 1: Hire 2 FTEs
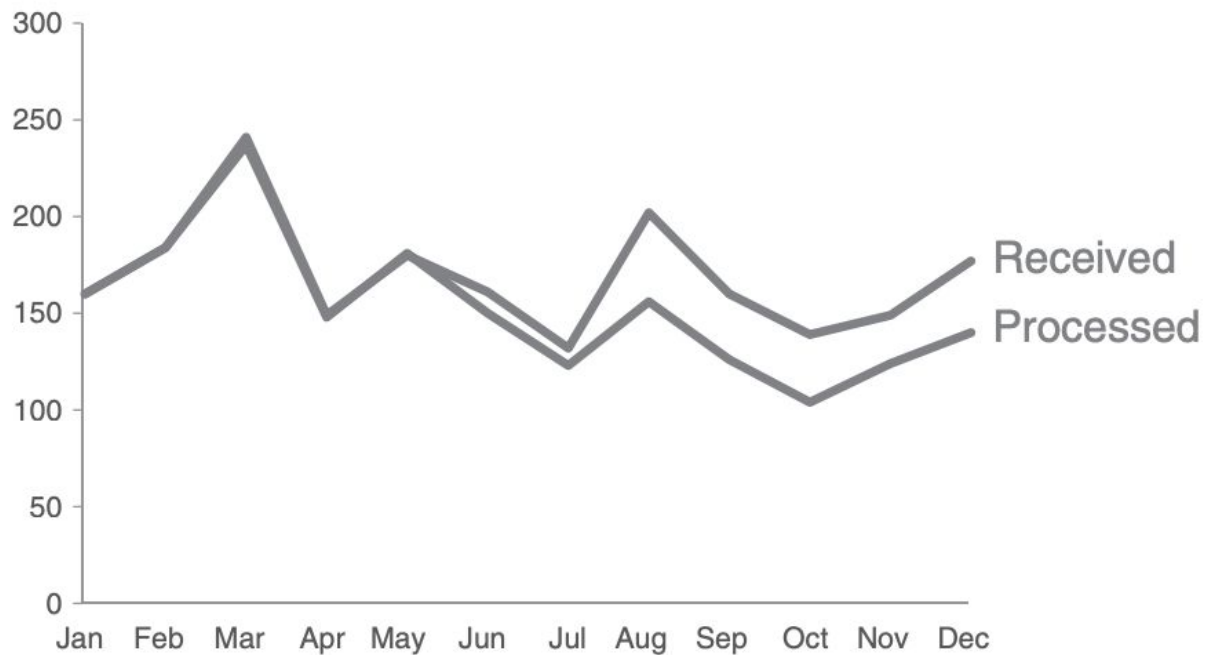
Case Study 1: Hire 2 FTEs
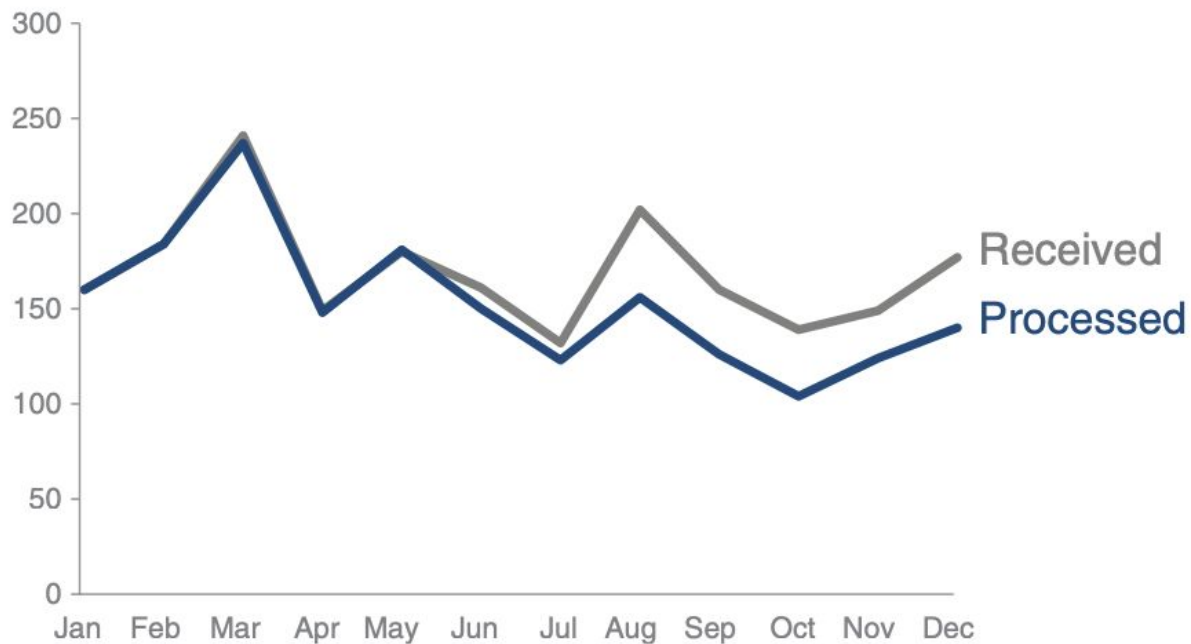
Case Study 1: Hire 2 FTEs

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Ticket volume over time

Number of tickets

- Received: Aug 202, Sep 160, Oct 139, Nov 149, Dec 177
- Processed: Aug 156, Sep 126, Oct 104, Nov 124, Dec 140
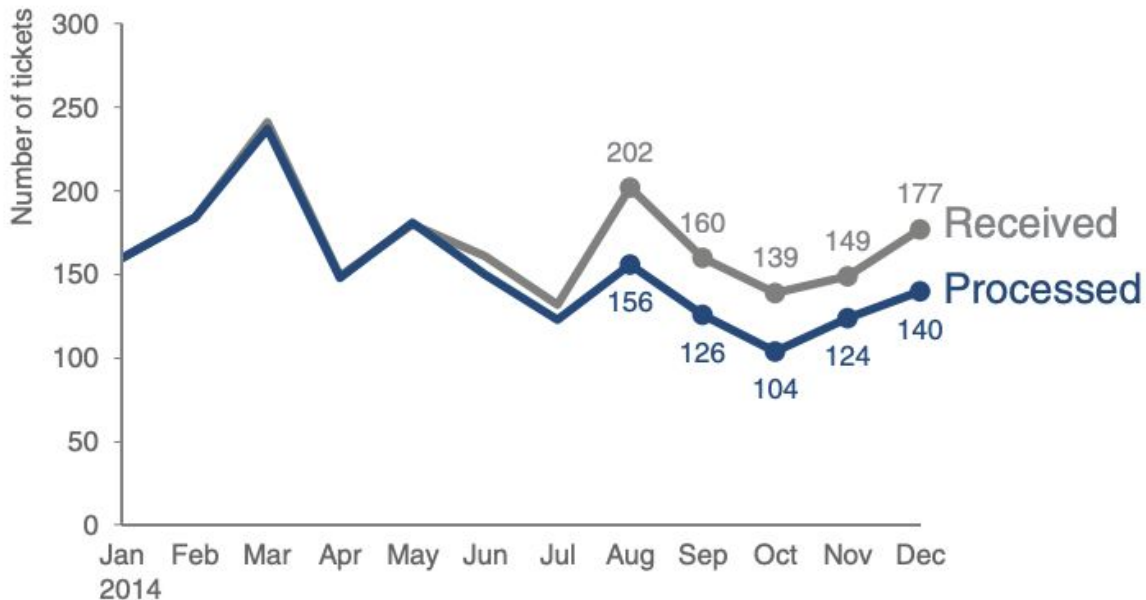
Please approve the hire of 2 FTEs
to backfill those who quit in the past year

Ticket volume over time

2 employees quit in May. We nearly kept up with incoming volume in the following two months, but fell behind with the increase in Aug and haven't been able to catch up since.

Received

Processed
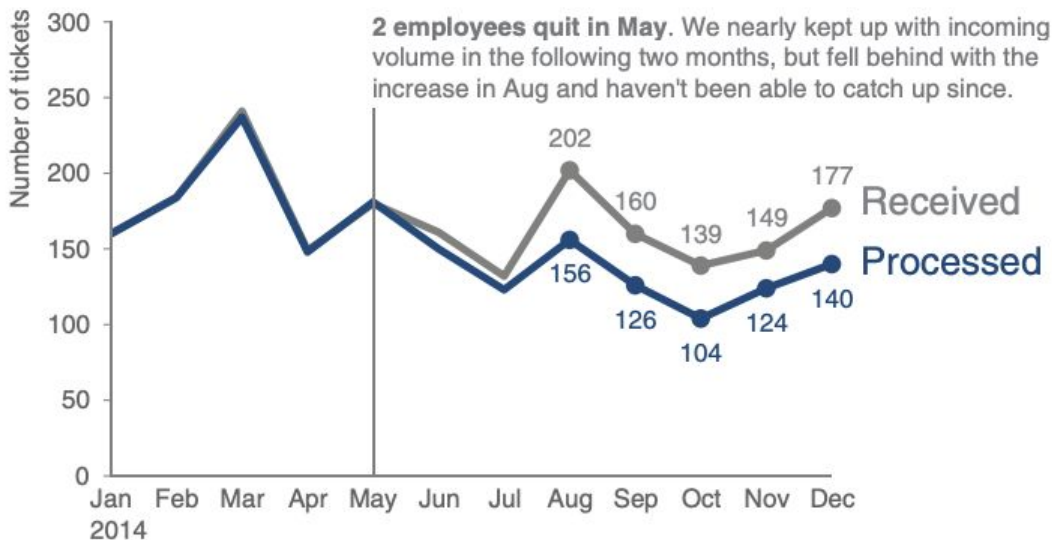
Case Study 2: Noise is an Issue

Top 10 design concerns

concerns per 1,000

Concern	Value
Engine power is less than expected	12.9
Tires make excessive noise while driving	12.3
Engine makes abnormal/excessive noise	11.6
Seat material concerns	11.6
Excessive wind noise	11.0
Hesitation or delay when shifting	10.3
Bluetooth system has poor sound quality	10.0
Steering system/wheel has too much play	8.8
Bluetooth system is difficult to use	8.6
Front seat audio/entertainment/navigation controls	8.2

Case Study 2: Noise is an Issue

7 of the top 10 design concerns have 10 or more concerns per 1,000.
Discussion: is this an acceptable default rate?

Top 10 design concerns

concerns per 1,000

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A visual with strong preattentive attributes

Of the top design concerns, three are noise-related.

Top 10 design concerns

concerns per 1,000

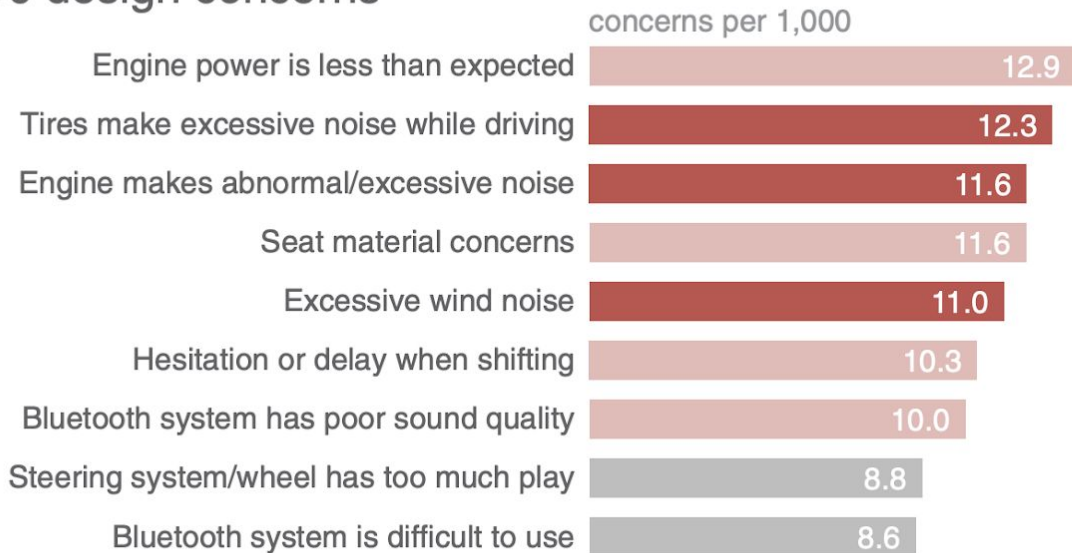| Design concern	Value
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Bluetooth system is difficult to use	8.6

Comments indicate that **noisy tire issues** are most apparent **in the rain**.

Complaints about **engine noise** commonly cited **after the car had not been driven for a while**.

Excessive **wind noise** is noted primarily in **freeway driving at high speeds**.

6

Constructing the story

The Magic of Storytelling

- Story is a time-tested structure; humans have been communicating with stories throughout history. We can leverage this powerful tool for our business communications.

- Aristotle introduced a basic but profound idea: that story has a clear beginning, middle, and end. This concept has been refined over time and is commonly referred to as the setup, conflict, and resolution.

- In the business world, this typically takes the form of PowerPoint slides filled with bulleted facts and statistics.

- It's an intellectual process. But it is problematic, because while you're trying to persuade your audience, they are arguing with you in their heads.

- "If you do succeed in persuading them, you've only done so on an intellectual basis. That's not good enough, because people are not inspired to act by reason alone" (Fryer, 2003).

The Beginning

- In this section, we set up the essential elements of story—the setting, unresolved state of affairs, and desired outcome—getting everyone on common ground so the story can proceed.

- Questions to consider and address when it comes to setting up the story:
    - The setting: When and where does the story take place?
    - The main character: Who is driving the action? (This should be framed in terms of your audience!)
    - The imbalance: Why is it necessary, what has changed?
    - The balance: What do you want to see happen?
    - The solution: How will you bring about the changes?

The Middle

- Once you've set the stage, so to speak, the bulk of your communication further develops "what could be," with the goal of convincing your audience of the need for action.

- You retain your audience's attention through this part of the story by addressing how they can solve the problem you introduced.

- You'll work to convince them *why* they should accept the solution you are proposing or act in the way you want them to.

- The following are some ideas:
  - Further develop the situation or problem by covering relevant background.
  - Incorporate external context or comparison points.
  - Give examples that illustrate the issue.
  - Include data that demonstrates the problem.
  - Articulate what will happen if no action is taken or no change is made.
  - Discuss potential options for addressing the problem.
  - Illustrate the benefits of your recommended solution.
  - **Make it clear to your audience why they are in a unique position to make a decision or drive action**.

The End

- Finally, the story must have an end.

- End with a call to action: make it totally clear to your audience what you want them to do with the new understanding or knowledge that you've imparted to them.

- To wrap up, you can think about recapping the problem, introduced in the beginning, and the resulting need for action, reiterating

7

Final Thoughts

Final Thoughts

- Remember the 3 big questions: who, what and how.
- Choose the visual prudently.
  - Pie charts are evil.
- Be mindful of the audience's cognitive load (actual or perceived).
  - When our visuals feel complicated, we run the risk of our audience deciding they don't want to take the time to understand what we're showing, at which point we've lost our ability to communicate with them. This is not a good thing.
- Reduce clutter using Gestalt visual principles.
- Without other visual cues, most members of your audience will start at the top left of your visual or slide and scan with their eyes in zigzag motions across the screen or page.
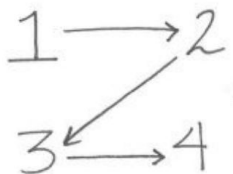
- Text is your friend, as long as it is used thoughtfully.

Final Thoughts

- Learn to use your tools well.
- Devote time to developing skills of storytelling with data.
- Seek inspiration through good examples:
  - Make a copy of good data visualizations and create a visual library that you can add to over time and refer to for inspiration. Emulate the good examples and approaches that you see.
  - Remember, imitation is a good thing. We learn by emulating experts.
- Develop your own style.