

Selecting the right data

DATA COMMUNICATION CONCEPTS



Hadrien Lacroix
Curriculum Manager

Chapter 2

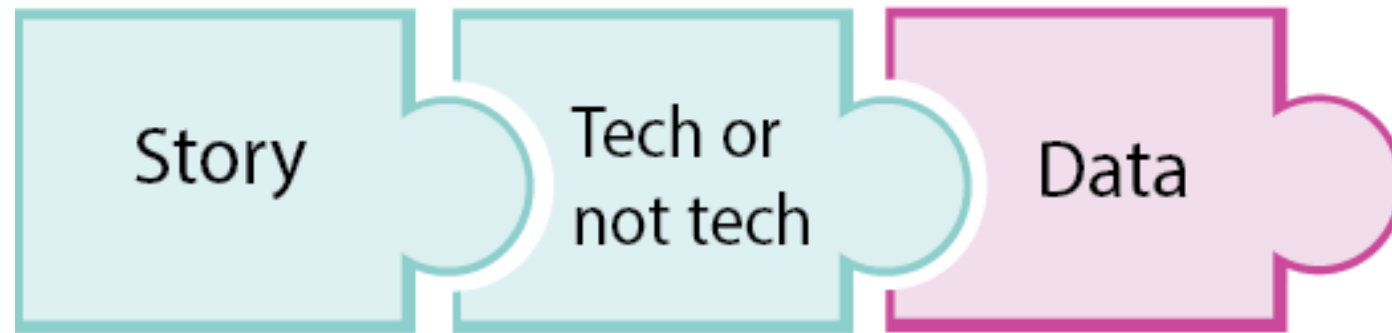
How to prepare for communicating data?

- Identify **personas**
- Selecting **findings** and **statistics**
- Selecting a **visualization**
- Choose **format**

Data storytelling road



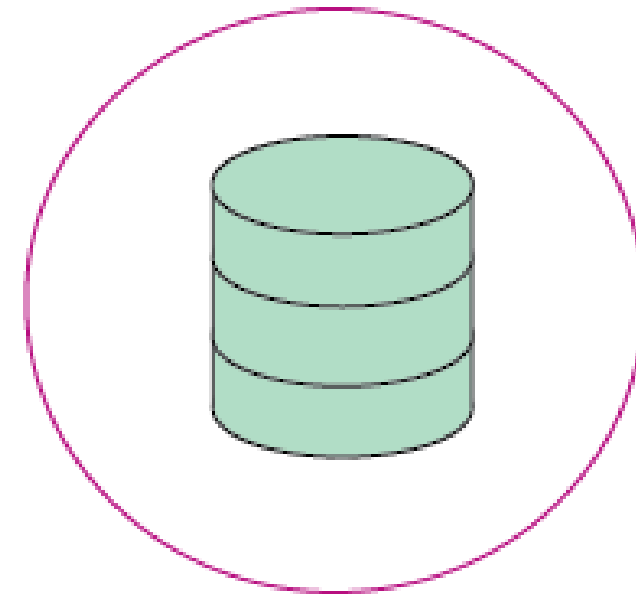
Data storytelling road



The right data

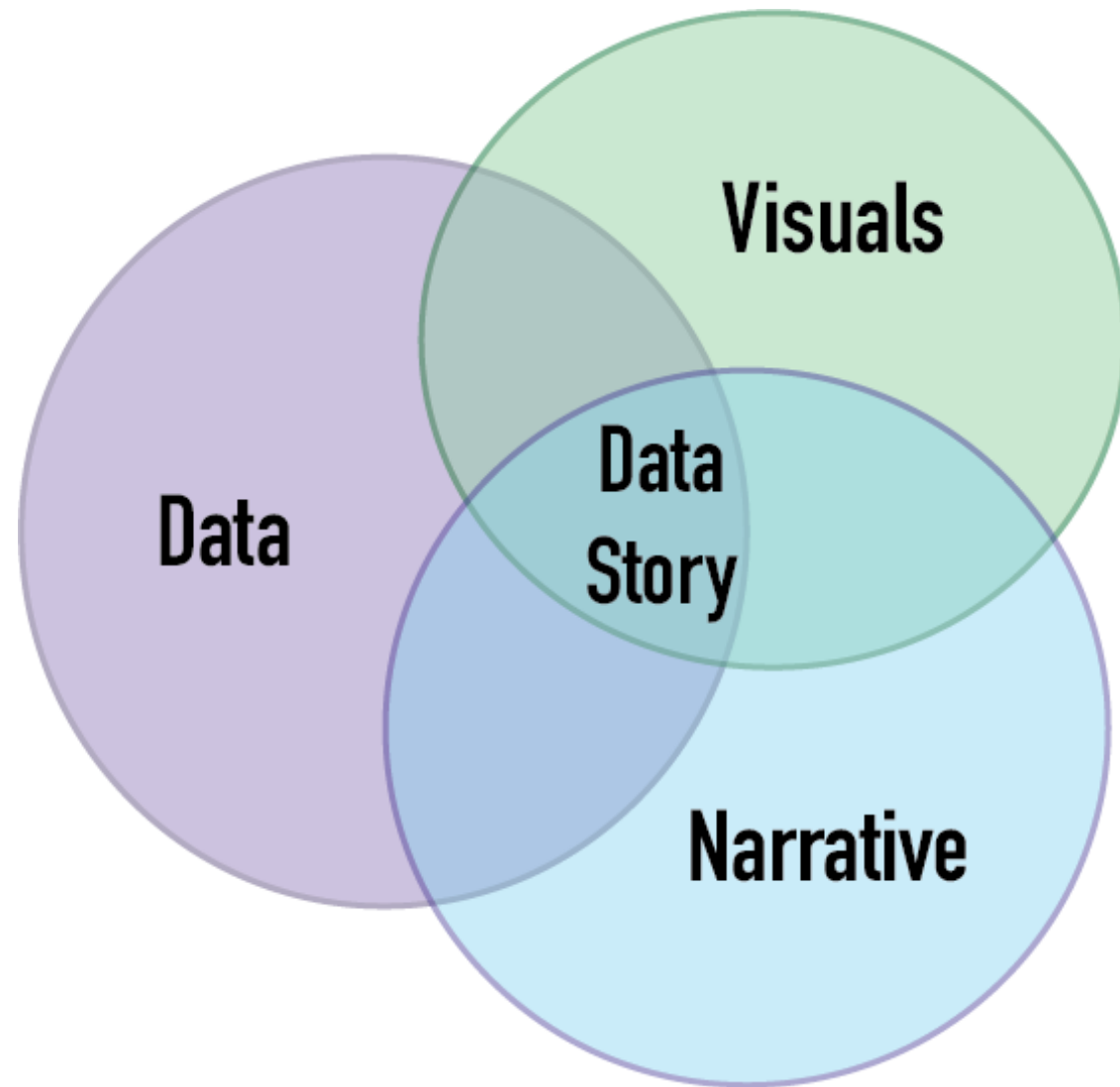
Selecting the right data implies including enough contextual insights in a story to better support the main point without overloading with information.

==> Minimal amount of information to support our story



¹ Dykes, Brent. Effective Data Storytelling. Wiley.

Data storytelling



1. **Data:**
 - Garbage in, garbage out
 - Adapt to the audience
2. Narrative
3. Visuals

Stakeholders

Any person interested in the project outcome or a decision or activity derived from it.

- Technical
- Non-technical

Identifying personas



- Description
 - Interests
 - Knowledge
- Select tailored findings

Identifying personas



Food project:

- Identify personas
- Select right findings

Executive team

- **Role:** Executive level (CEO, investor, director, founder)
- **Knowledge:** Fundamentals (technical aspects)
- **Interest:** Inform their decisions based on findings



Project manager

- **Role:** Project manager
- **Interest:** Project aligns with company objectives
- **Right data:**
 - Summary data: \$2M cost of marketing campaign
 - Metrics:
 - 10% monthly increase in number of customers
 - 2% risk of declining profits



Tech team

- **Role:**
 - Project collaborator
 - Technical supervisor
- **Knowledge:** Expert (Technical aspects)
- **Interest:**
 - Replicate project
 - Continue project



General audience

- **Role:**
 - Customer (external)
 - Other department staff (internal)
- **Knowledge:** Novice or generalist
- **Interests:**
 - To understand the general results and impact of the project



General audience

- **Role:**
 - Other department staff (internal)
- **Interests:**
 - To understand the general results and impact of the project
- **Right data:**
 - Historical data: Decline in profits
 - Correlation/impact:
 - Chocolate needs rebranding
 - Impact next year earnings



Audience skepticism

- Different levels of skepticism
- Different levels of argumentation
 - Convince yourself
 - Convince a friend
 - Convince a skeptic

Let's practice!

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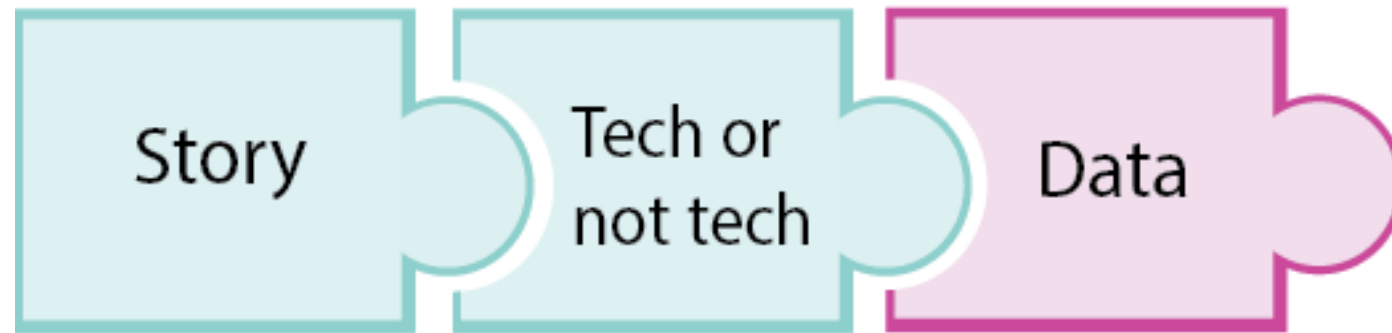
Showing relevant statistics

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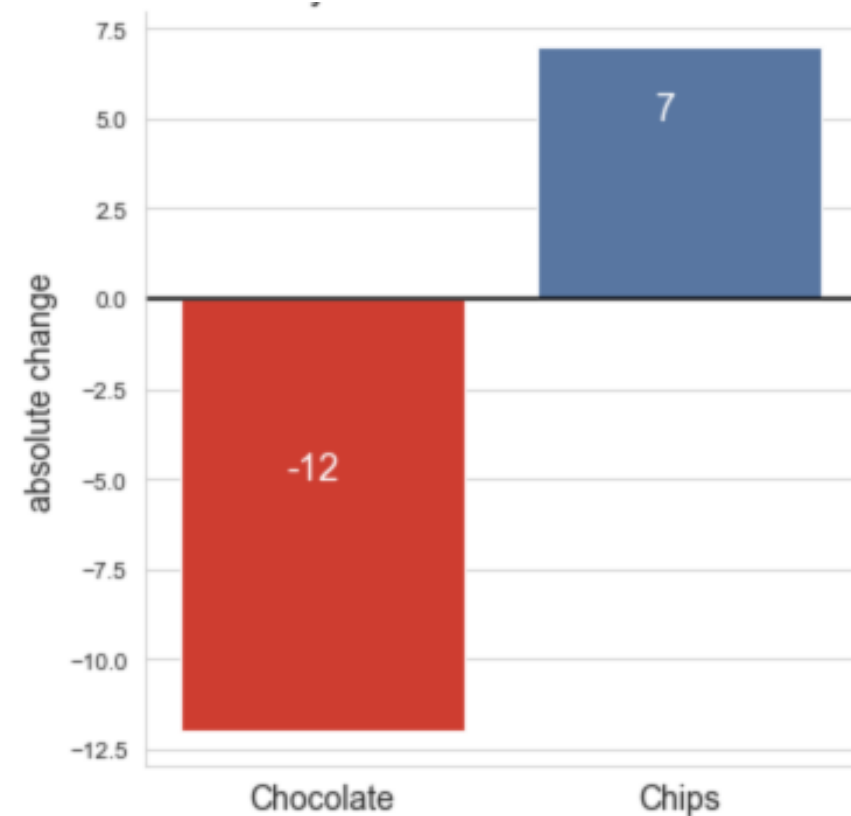
Data storytelling road



Variations of data

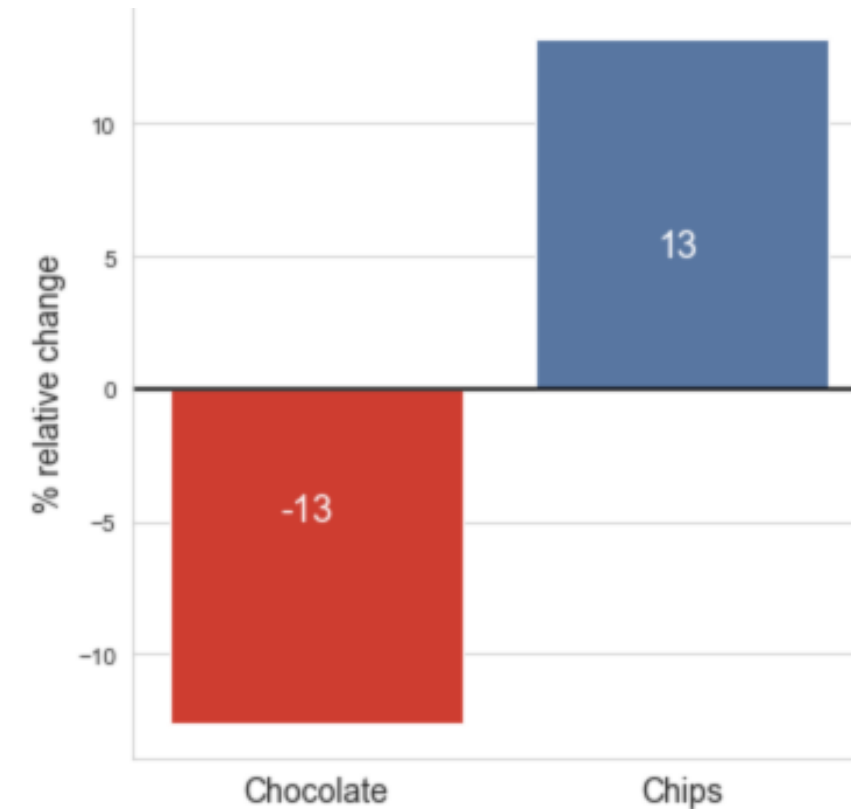
- **Absolute**

- Difference between 2018 and 2017 sales
- Absolute change and relative change depend on the quantity



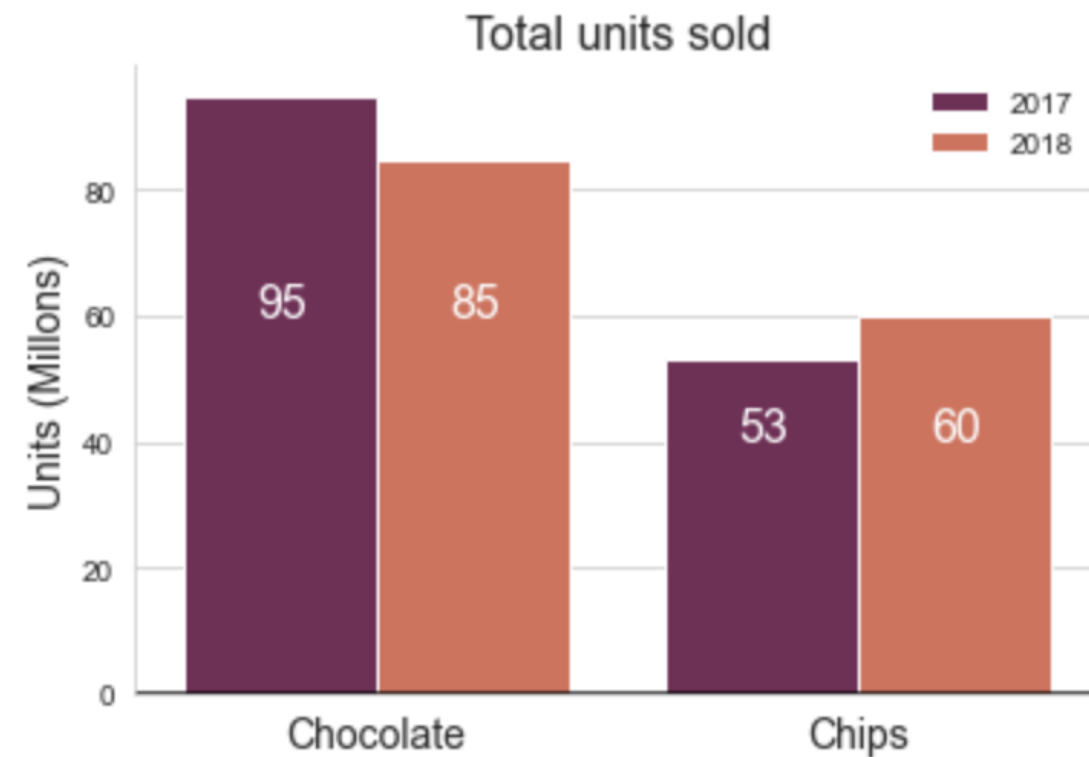
- **Relative**

- Percentage variation 2018 from 2017
- Small numbers more significant than reality

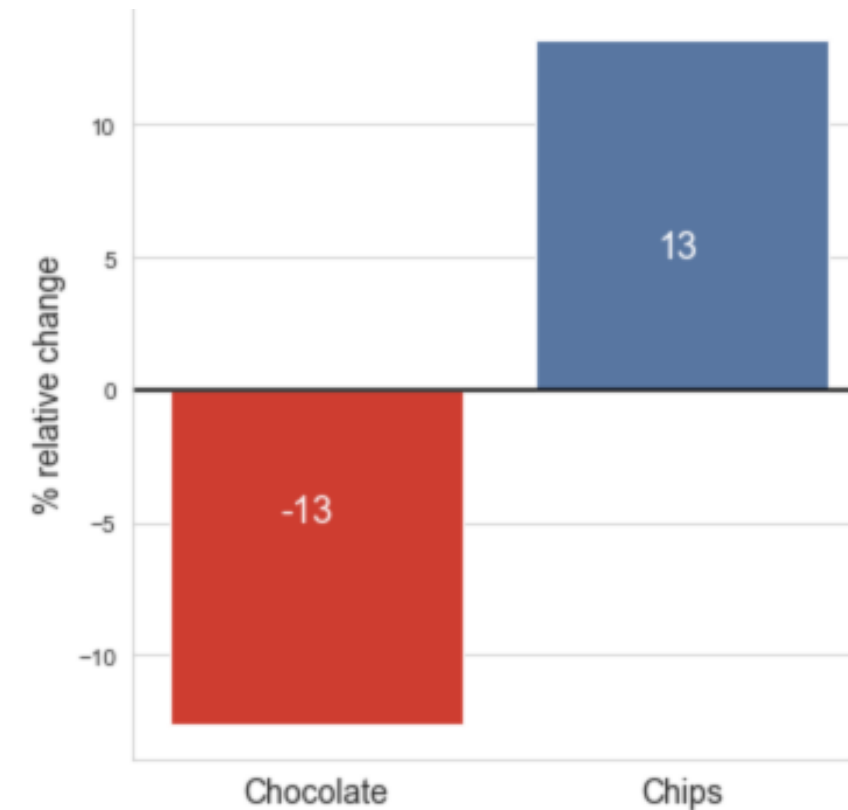


Variations of data

Absolute

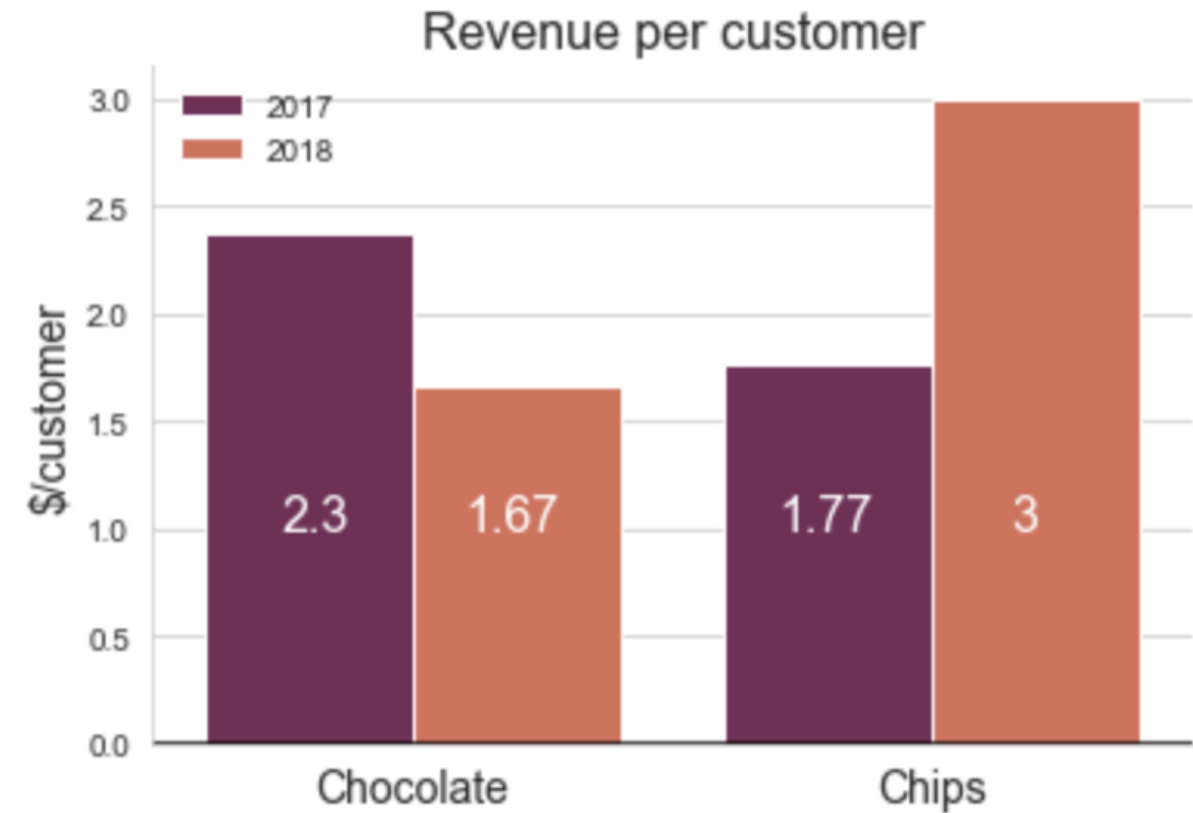


Relative



Ratio

- Quotient of two variables
 - Revenue per customer (**total product revenue/number customers**)
- Normalize values = **better comparisons**



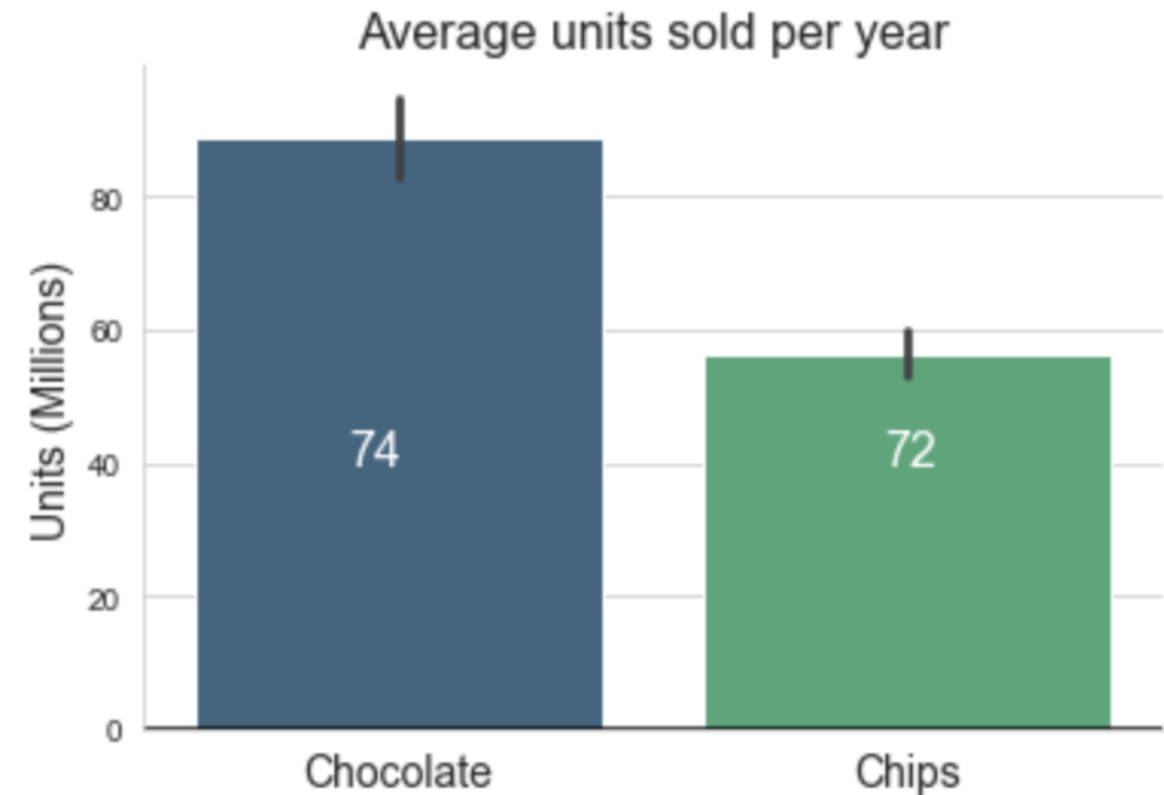
Aggregates

- Representative value:
 - Totals / counts

Aggregates

- Representative value:
 - Totals / counts
 - Mean

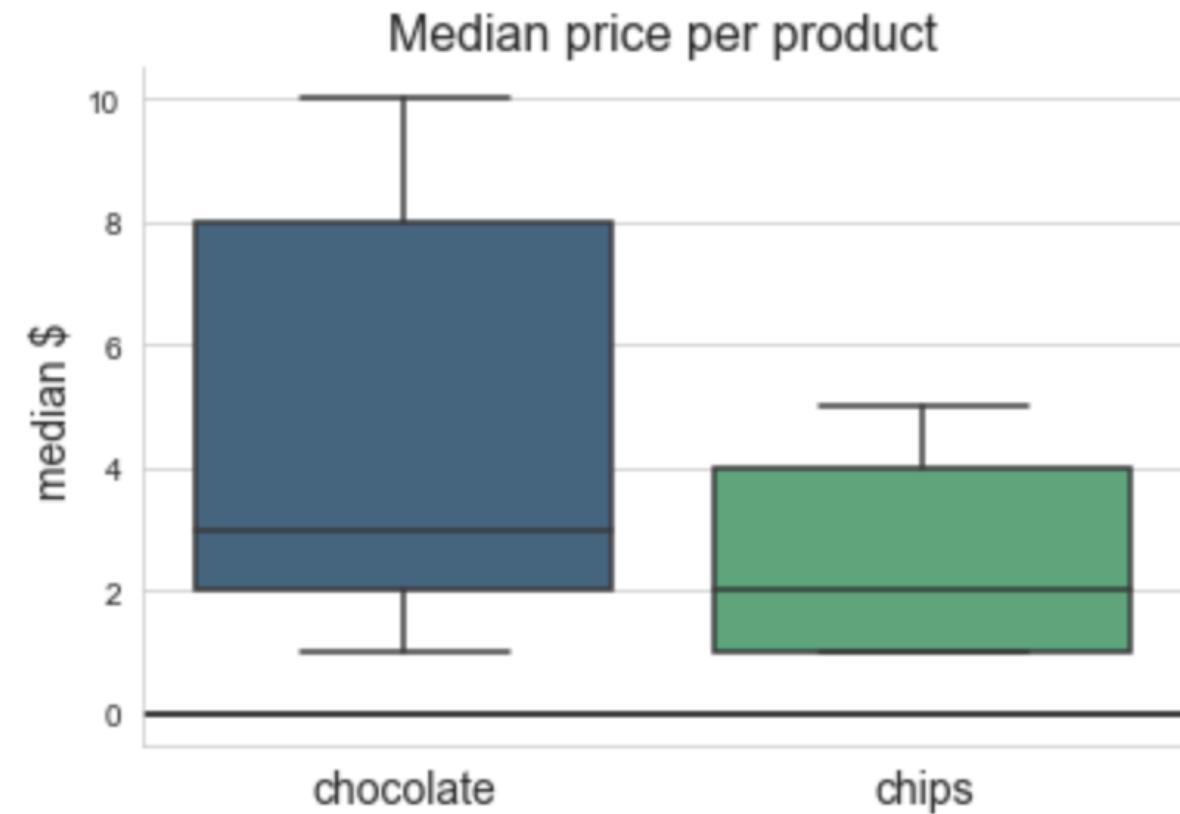
- Average units sold per year



Aggregates

- Representative value:
 - Totals / counts
 - Mean
 - Median

- Median price



Aggregates

- Representative value:
 - Totals / counts
 - Mean
 - Median
- Mean can be misleading (outlier)
- Distribution of the data
- Example:
 - 2019 US **average** salary: **\$51,916.27**
 - 2019 US **median** salary: **\$34,248.45**

p-value

What is p-value?

- Convention:
 - Value less than 0.05: statistical significance
 - Values close to 0.05: weak indicator

What is it not?

- Not proof of evidence:
 - Reject our hypothesis, but not that is false
- Consider alternatives or complementary metrics

¹ P-Values: Misunderstood and Misused. Front. Phys. 2016.

Let's practice!

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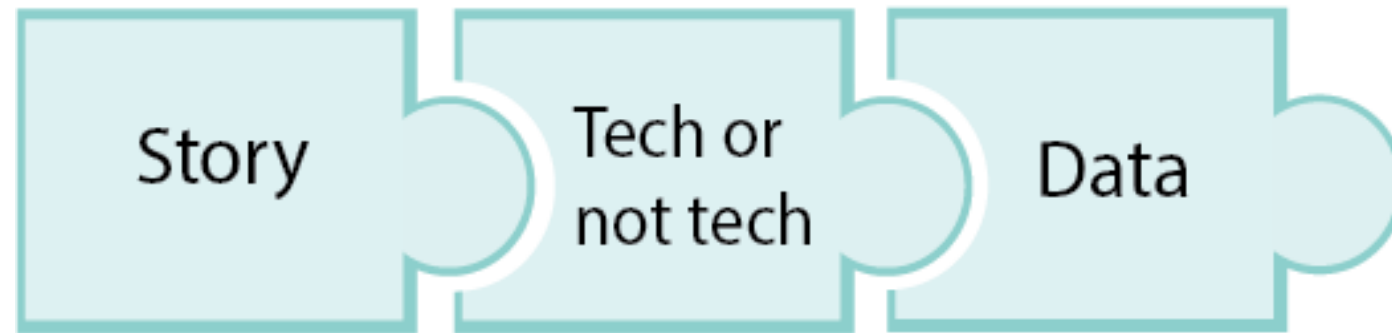
Visualizations for different audiences

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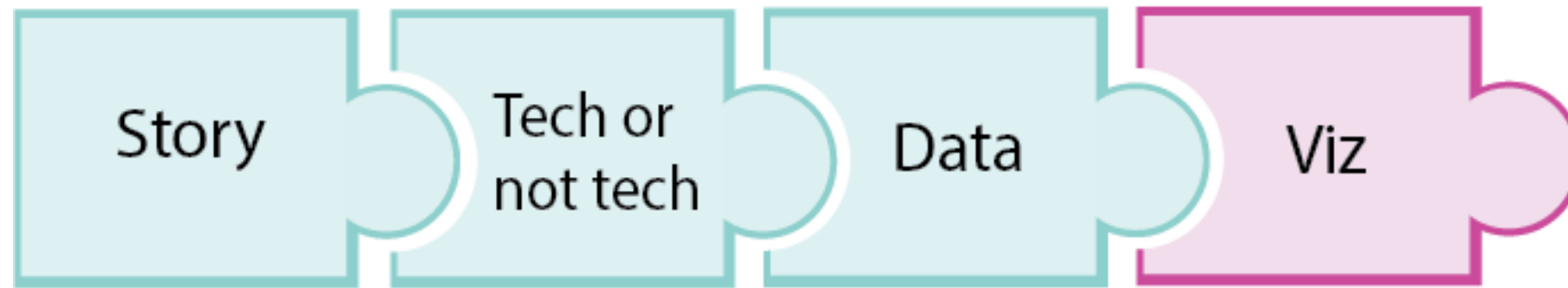


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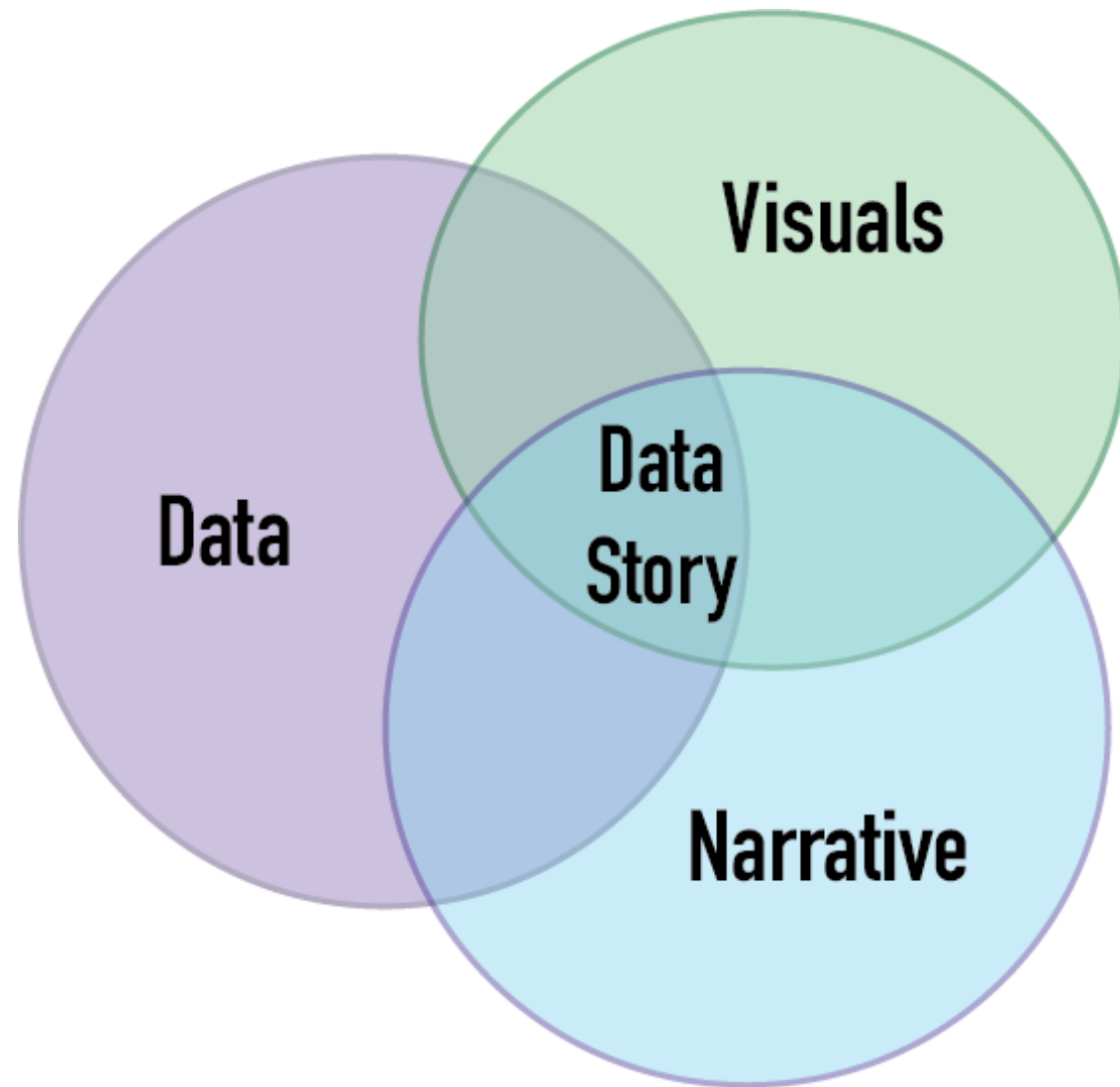
Communication strategy



Communication strategy



Data storytelling



1. Data
2. Narrative
3. **Visuals**
 - Expertise
 - Familiarity

Tailored message

- Investor

Marketing campaign avoid 20% revenue drop

- Technical lead

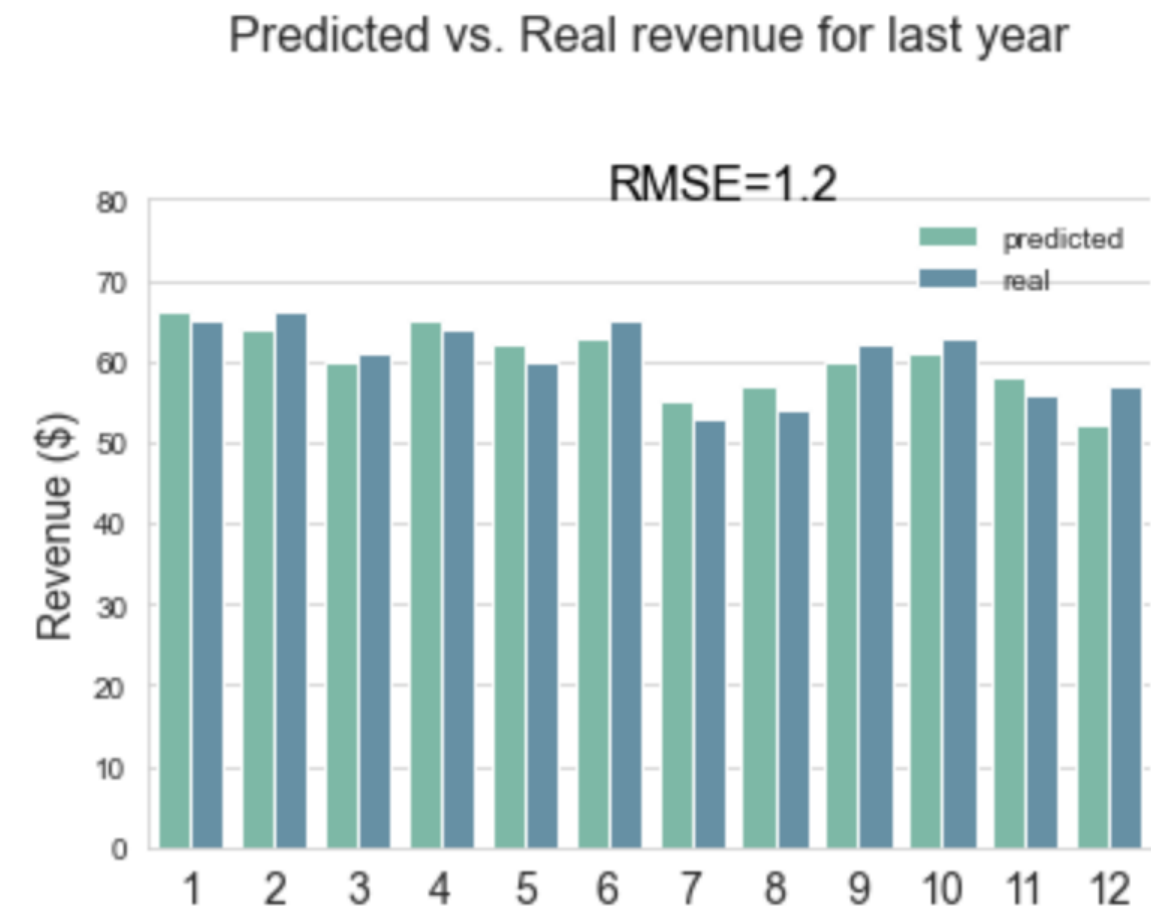
Model predicted revenue decline (RMSE: 1.2)

Directly linked to message

- Investor



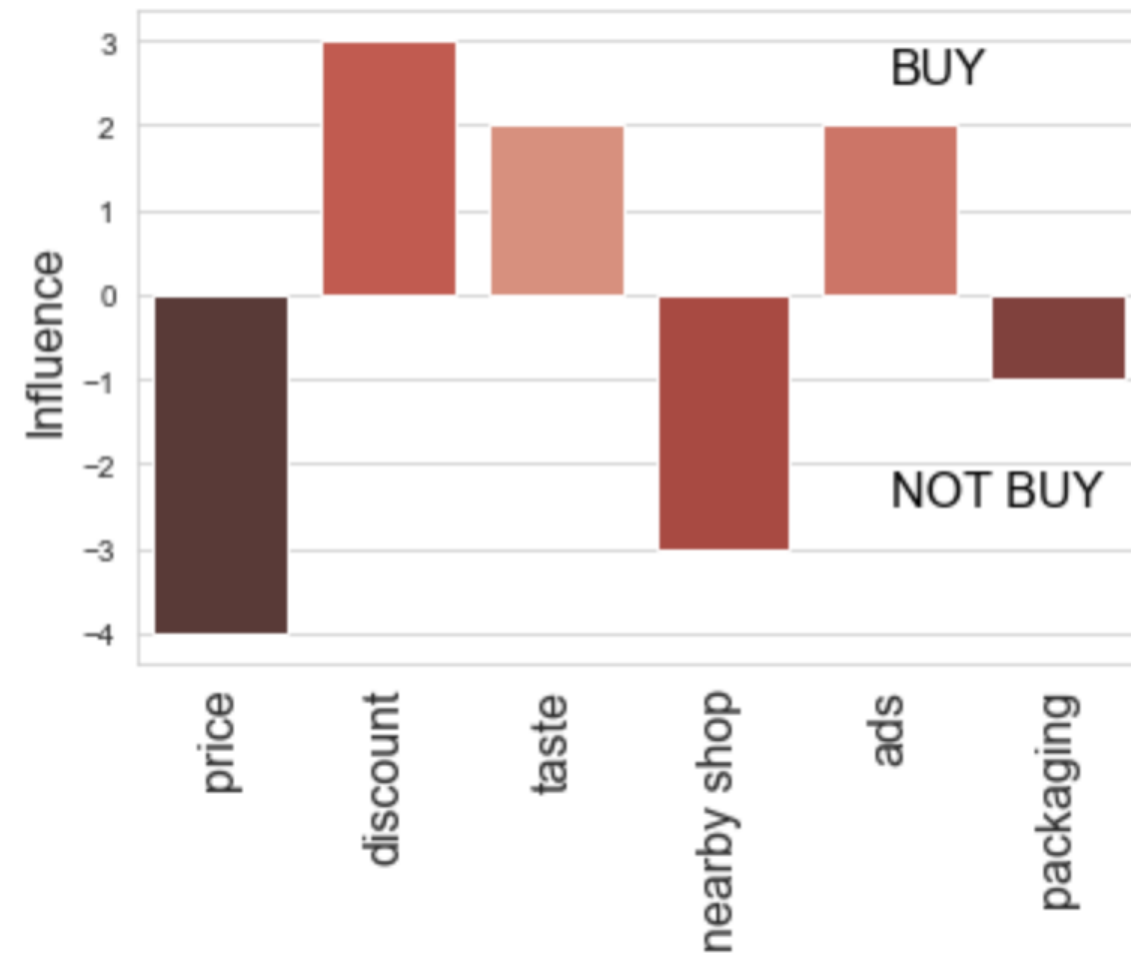
- Technical lead



Provide context

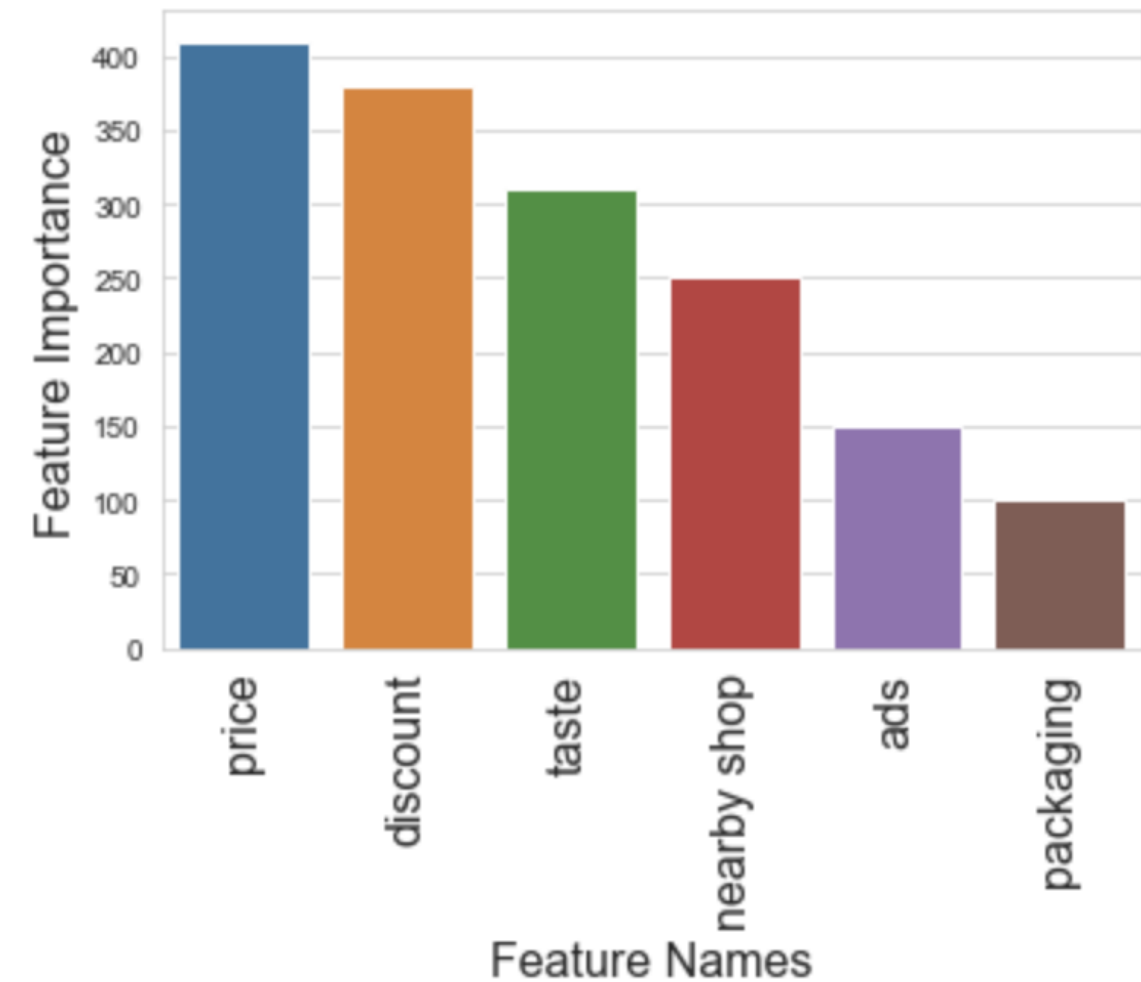
- Investor

Influence of different factors on customer behavior



- Technical lead

Feature Importance



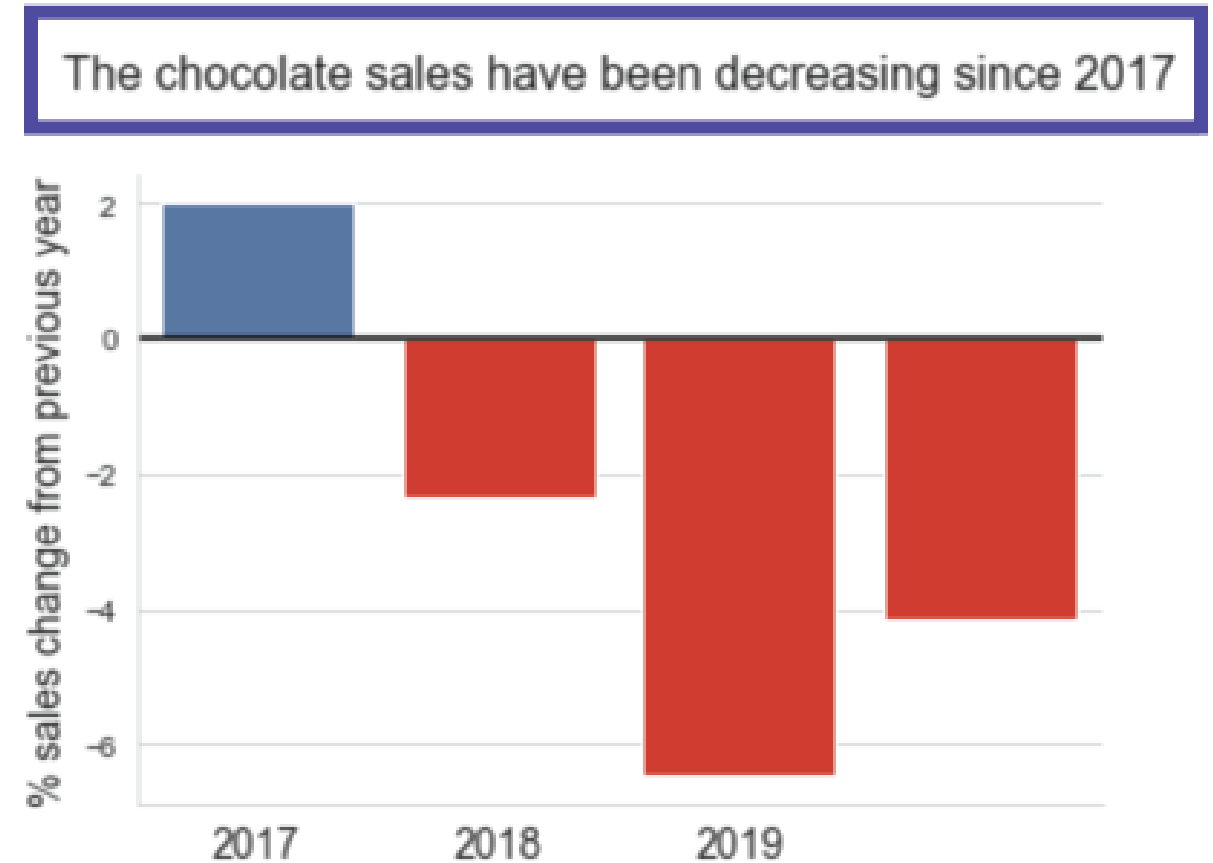
More best practices

- Pareto principle:
 - Aggregate less relevant data
 - Include chocolate, chips and other products (aggregated)
- Approachable and engaging visuals
- How many / how quickly
- Less is more

McCandless method

1. Introduce visualization by name

- Graph headline
- Clear and obvious
- y vs x technique



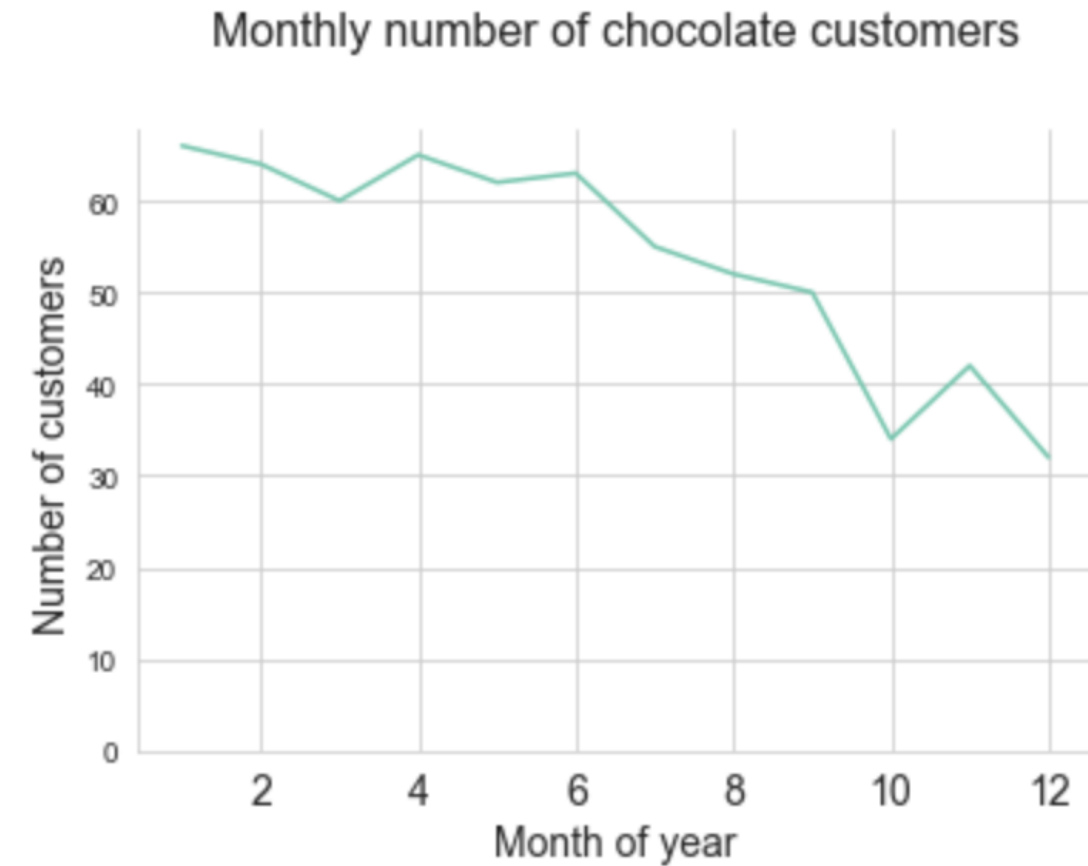
¹ <https://artscience.blog/home/the-mccandless-method-of-data-presentation>

McCandless method

1. Introduce visualization by name
2. **Anticipate audience's questions**
 - Focus on story not on decoding graph

McCandless method

1. Introduce visualization by name
2. Answer audience's questions
3. **State insights**



McCandless method

1. Introduce visualization by name
2. Answer audience's questions
3. State insights
4. **Help the audience relate**
 - Importance
 - Action items

Let's practice!

DATA COMMUNICATION CONCEPTS

Choosing the appropriate format

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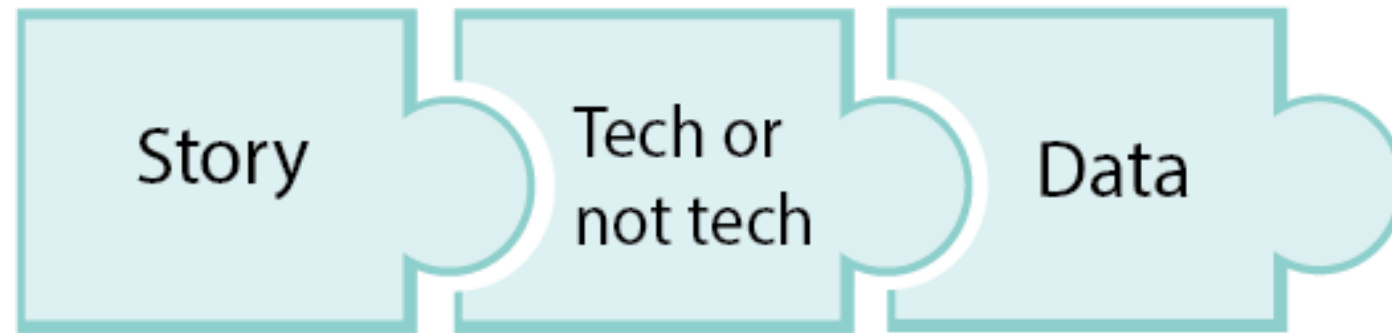
Data storytelling road



Data storytelling road



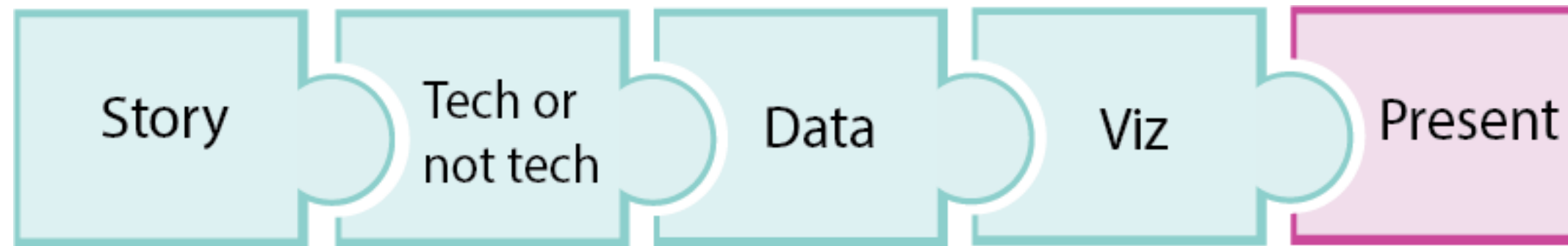
Data storytelling road



Data storytelling road



Data storytelling road



Which format is more effective?

Good communication format

- Key information
- Engaging
- Easy to understand

Which format is more effective?

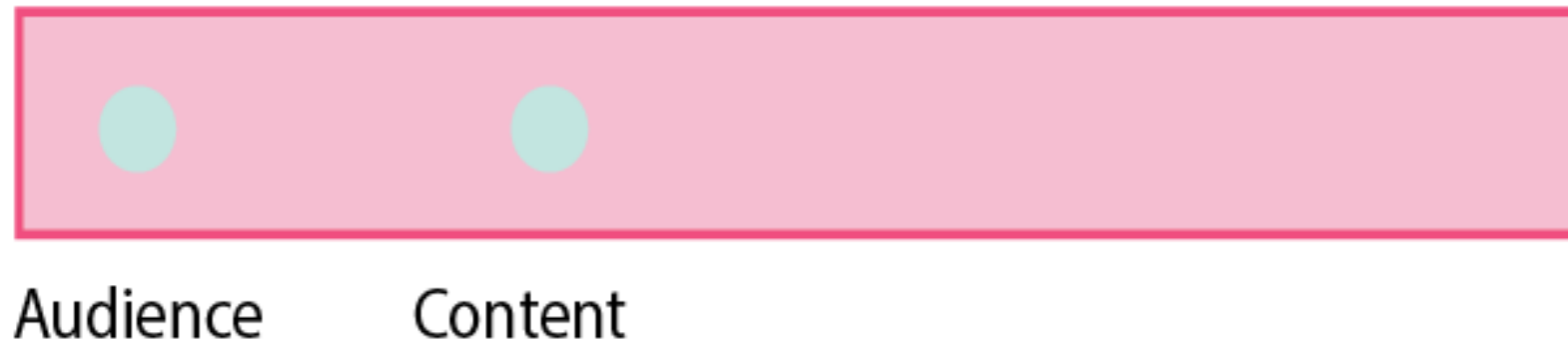
1. Written reports
2. Oral presentation

Presentation strategy

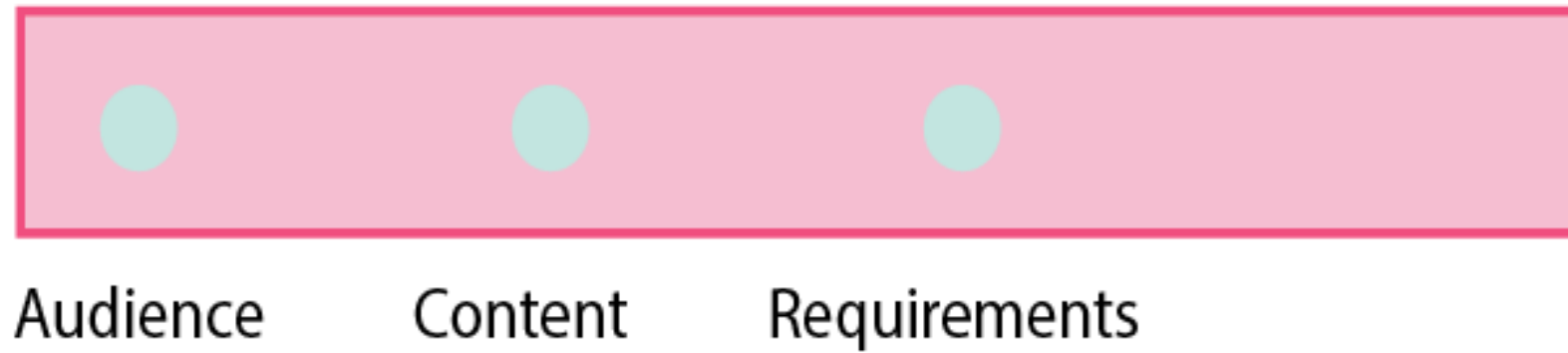


Audience

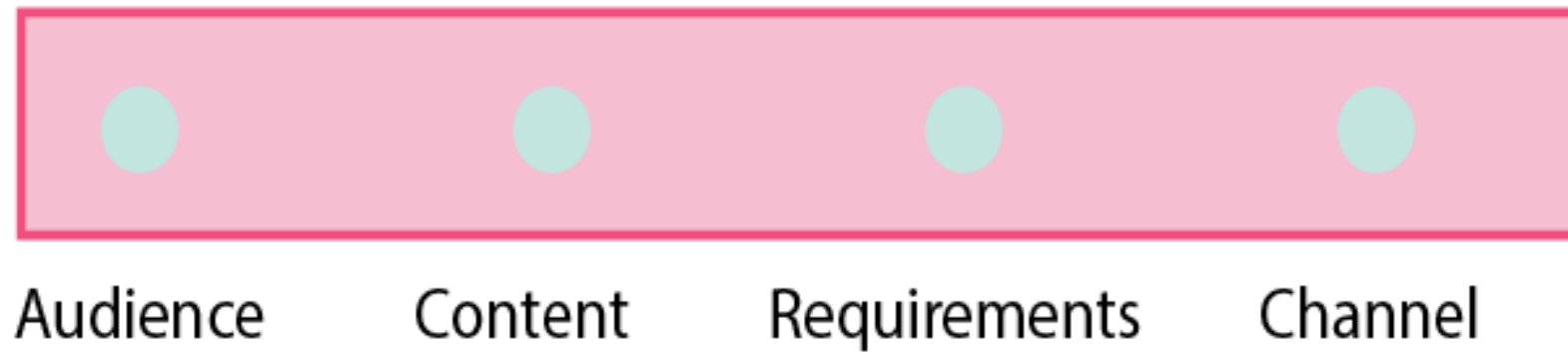
Presentation strategy



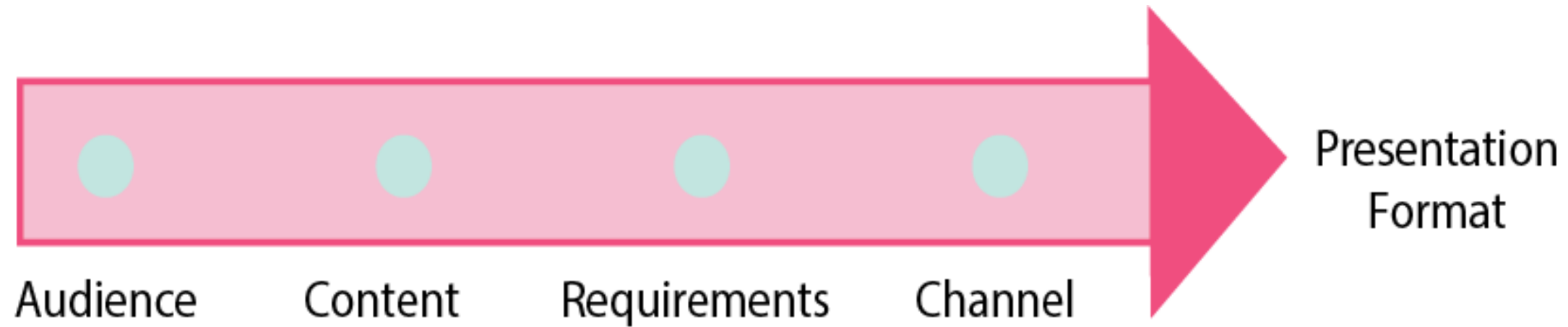
Presentation strategy



Presentation strategy



Presentation strategy



Stakeholders

- **Who?**
- **Why?**
 - Accountability
 - Methodology
- **How?**
 - Make decisions
 - Start new project
- **What?**
 - Results
 - Impact



Content



- Results?
- Conclusion?
- Recommendations?
- Methods?

¹ Photo from Unsplash

Requirements

- Time
- Authority
- Time zone

Consumption

- **Format**
 - Document
 - Slide deck
- **Delivery** mechanism
 - Live
 - Asynchronous
- **Audience**
 - Conference room
 - Ballroom



¹ Photo from Unsplash

Oral communication

Advantages

- Relationship with the audience
- Immediate feedback
- Non-verbal cues

Disadvantages

- No permanent record of communication
- Not suitable for long messages

Written communication

Advantages

- Permanent record of communication
- Shared easily with a large audience
- Less emotional reaction to message
- Suitable to share code with colleagues

Disadvantages

- Hard to see if the message was understood
- No immediate feedback

Appropriate format

Oral presentation

- Who? **CEO**
- Why? **Monthly update**
- What? **Accountability**
- Content: **Conclusions**
- Requirement: **Time**
- Channel: **Meeting**



¹ Photo from Unsplash

Appropriate format

Report

- Who? **CEO**
- Why? **Important decisions ahead**
- How? **Report to investors**
- Content: **Recommendations**
- Channel: **Email**



¹ Photo from Unsplash

Let's practice!

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