

Lecture 5

DD 324:

Data Visualisation

Convincing with Data

28s Jan 2025 · Gyan Lakhwani · gyanlakhwani@gmail.com · Department of Design, DTU

What can we do with data?

Convincing

Convincing



What can we do with data?

Exhibit

Show raw data

List, Table, Infographic

Explain

Answer Questions

Data journalism, report

Explore

Finding what to ask

Dashboards, simulations

Experience

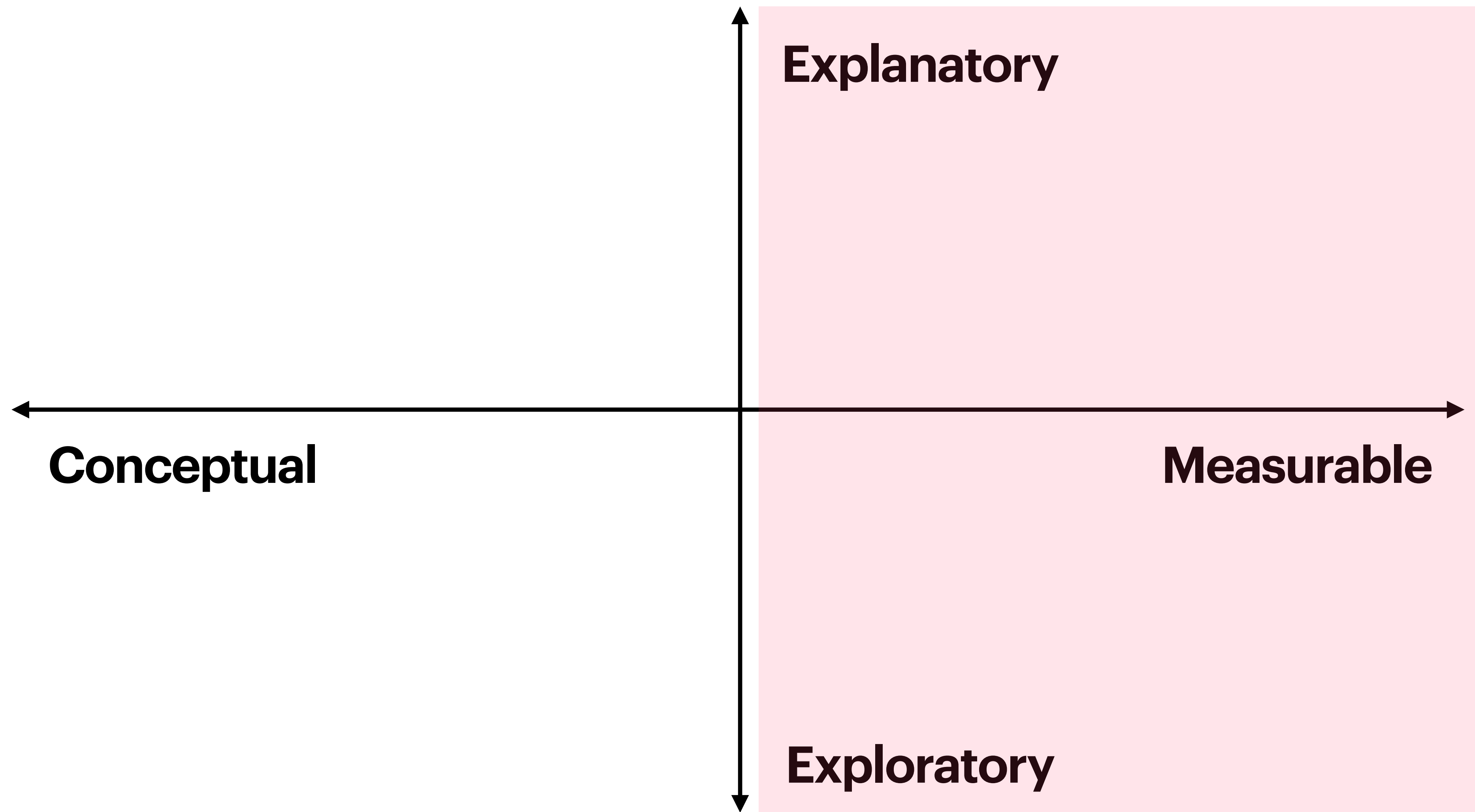
Finding meaning in data

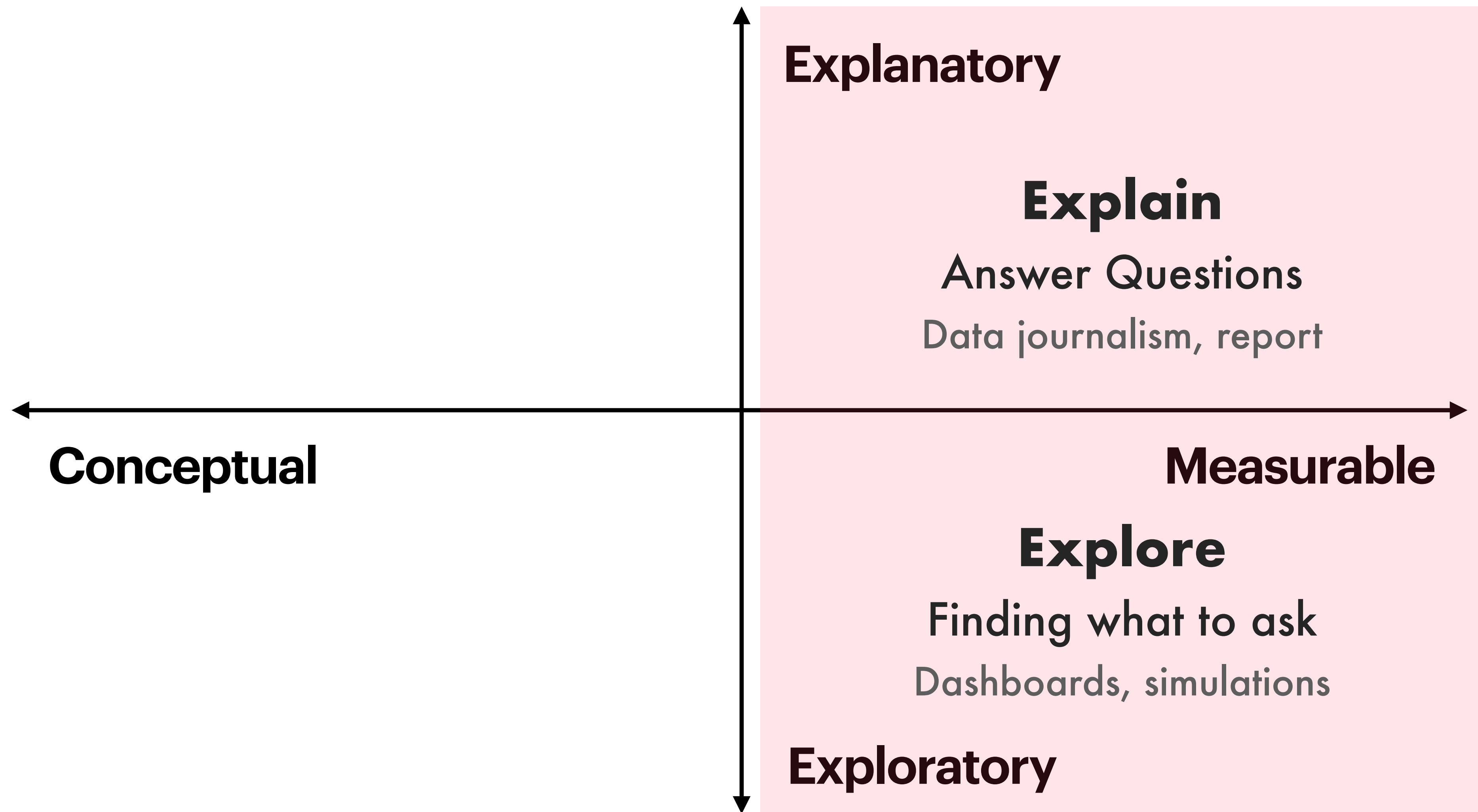
Data art piece, New media
installation

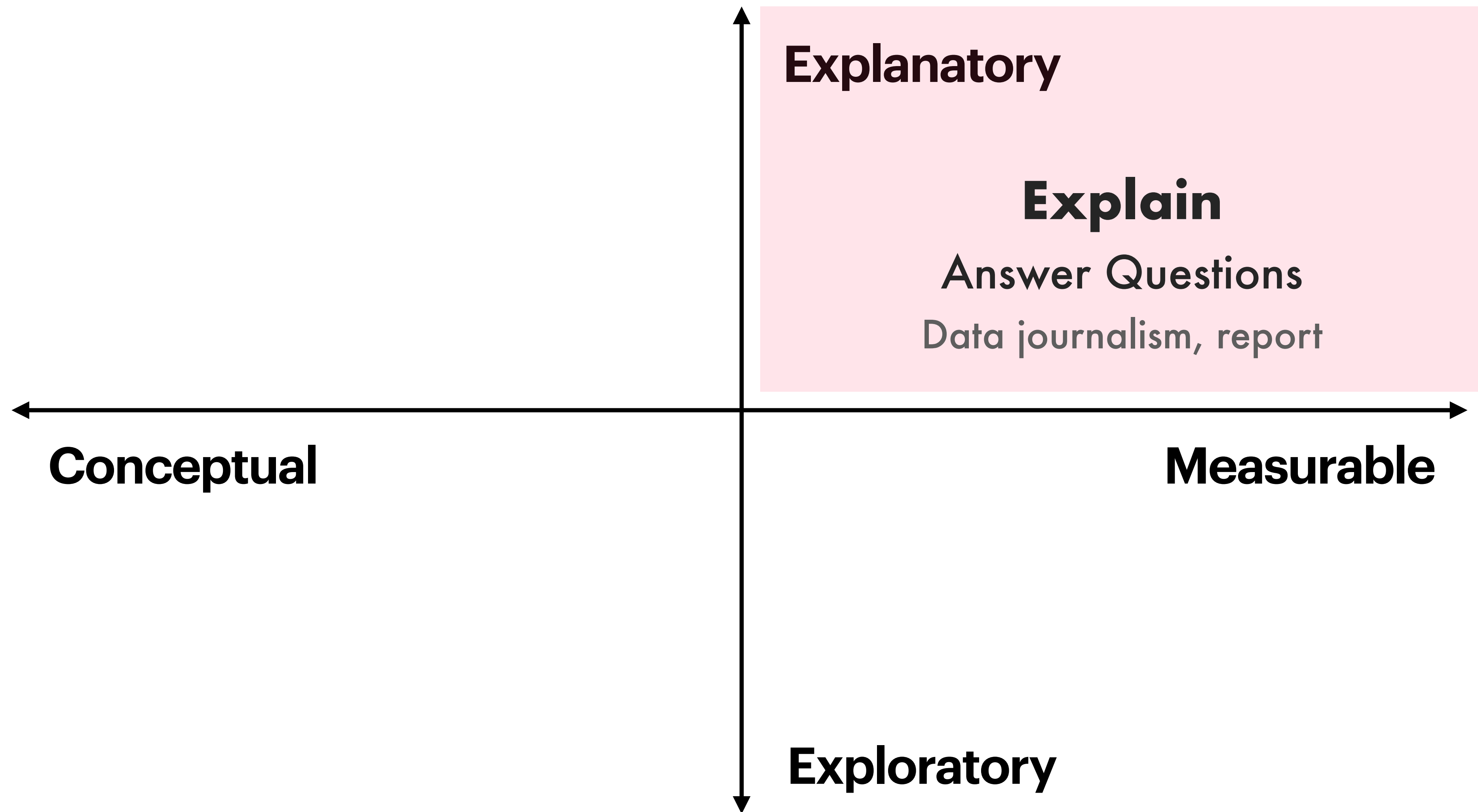
Enable

Building tools to visualise

specific use cases
Software for data viz







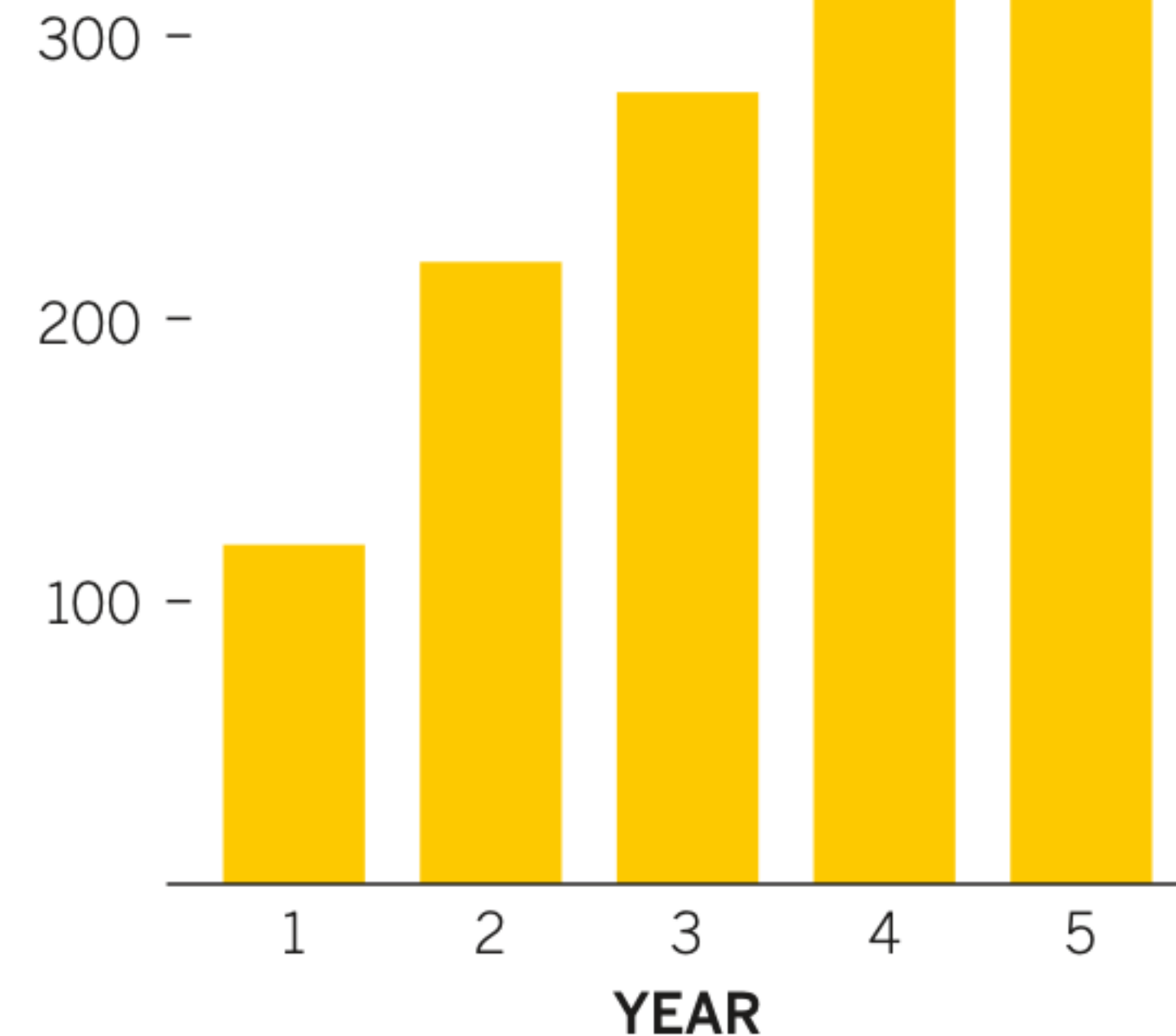
People don't need to see data in charts, they need to see *ideas*.

Year	Cumulative Revenue (Million \$)
1	120
2	210
3	280
4	310
5	320

People don't need
to see data in
charts, they need
to see *ideas*.

REVENUE GROWTH

CUMULATIVE REVENUE
\$400 million



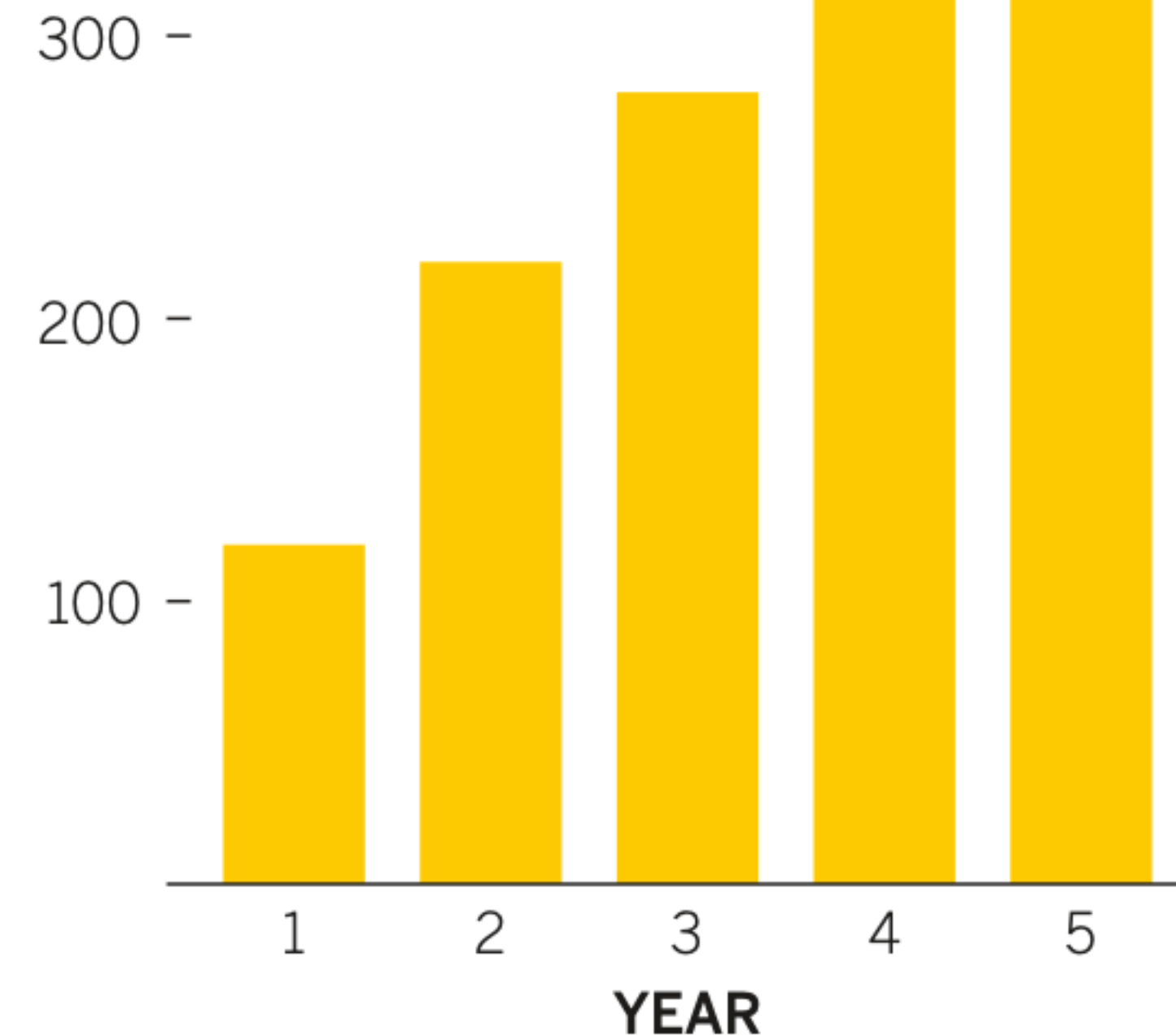
SOURCE: COMPANY RESEARCH

People don't need
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charts, they need
to see *ideas*.

What is this chart
saying to you?

REVENUE GROWTH

CUMULATIVE REVENUE
\$400 million



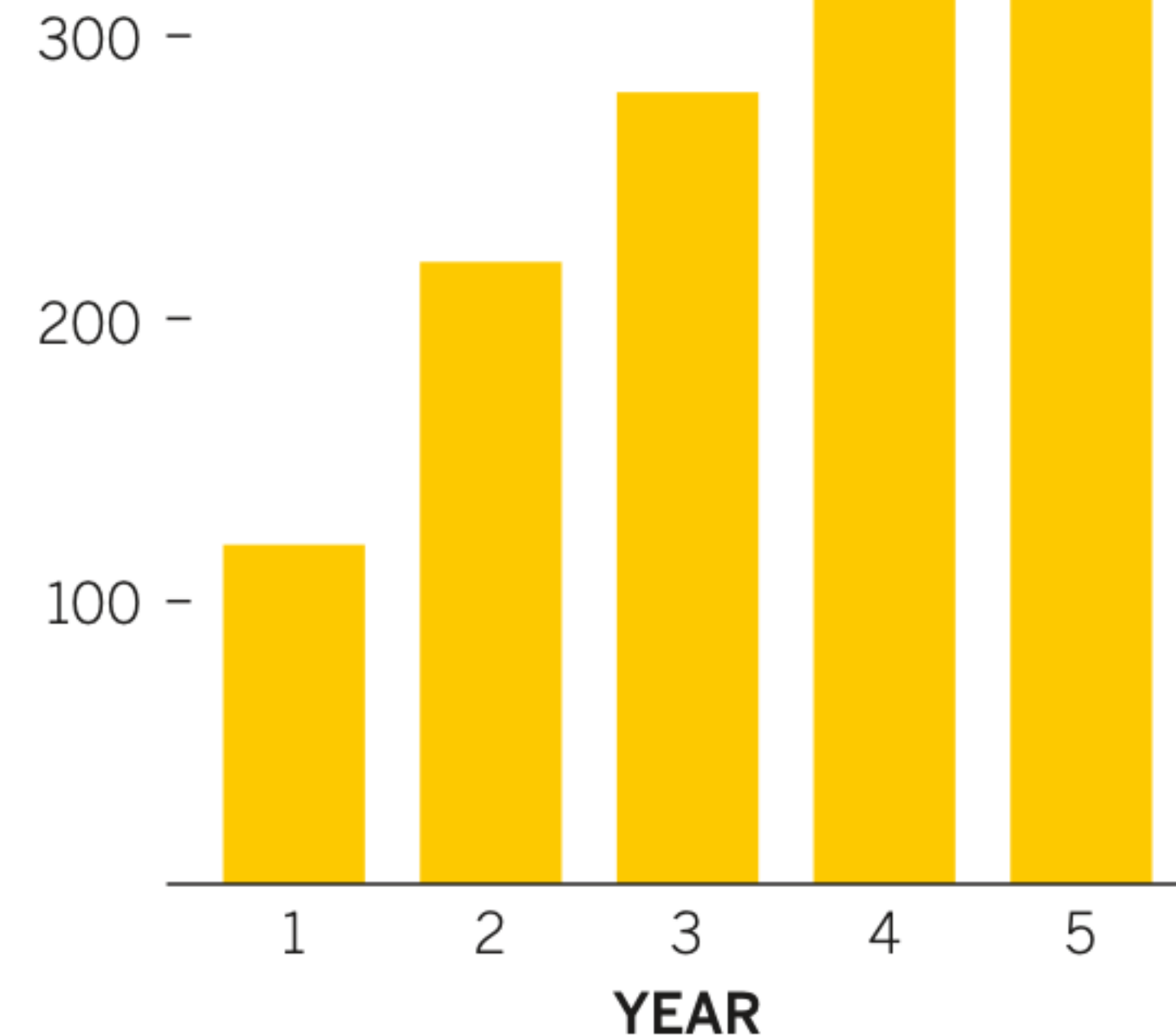
SOURCE: COMPANY RESEARCH

People don't need
to see data in
charts, they need
to see *ideas*.

Or, what is the
question it is
answering?

REVENUE GROWTH

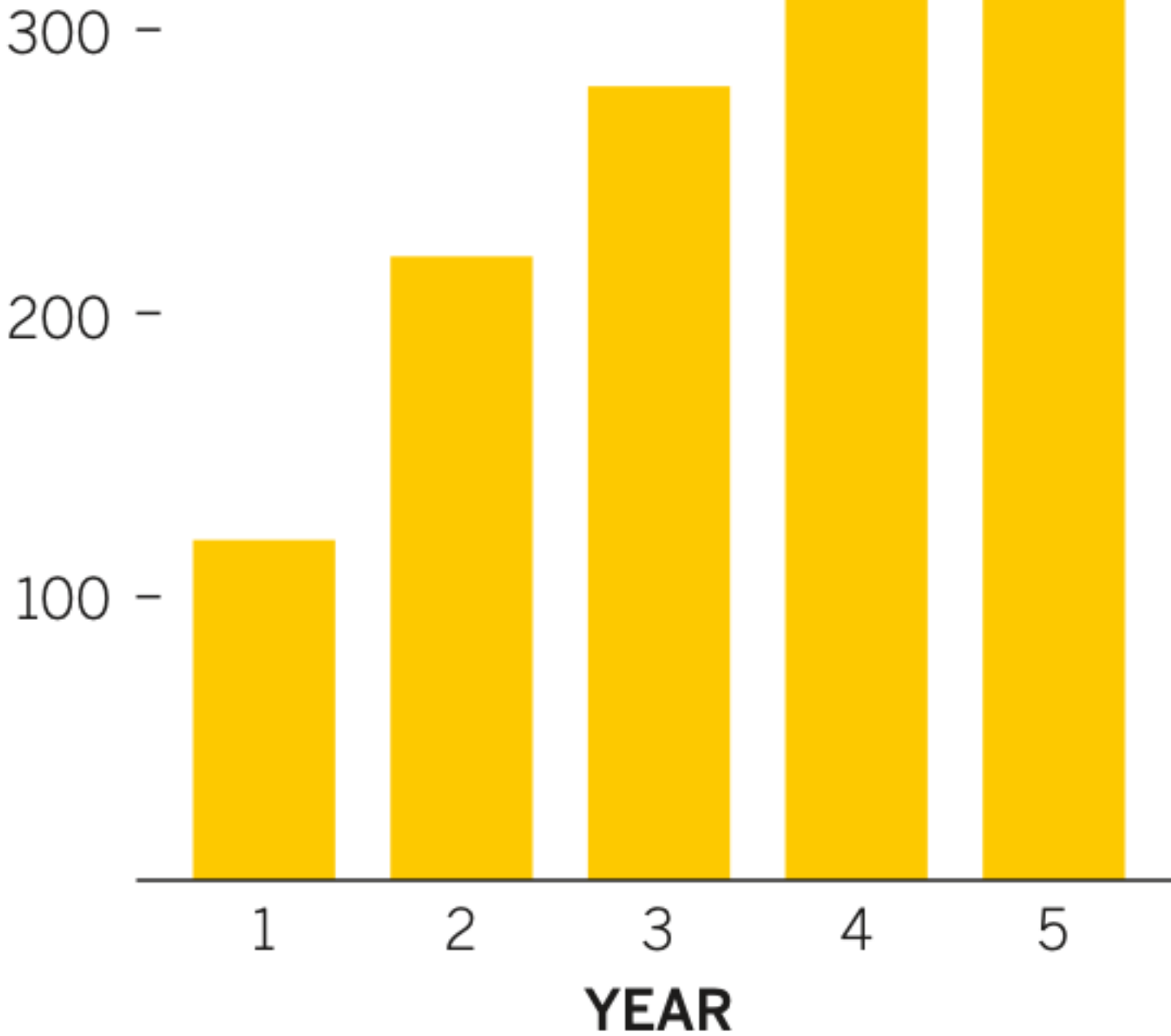
CUMULATIVE REVENUE
\$400 million



SOURCE: COMPANY RESEARCH

REVENUE GROWTH

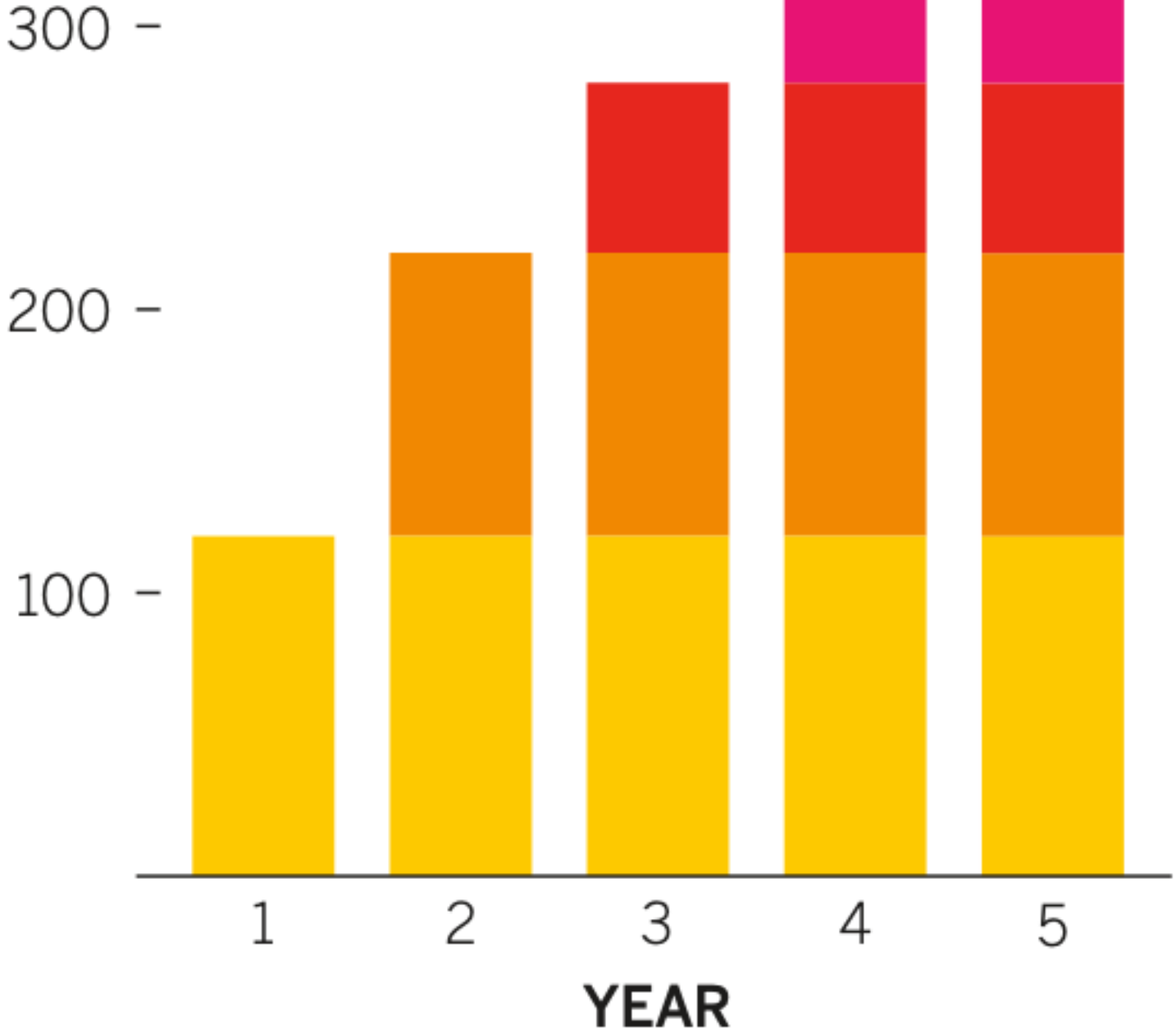
CUMULATIVE REVENUE
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SOURCE: COMPANY RESEARCH

REVENUE GROWTH

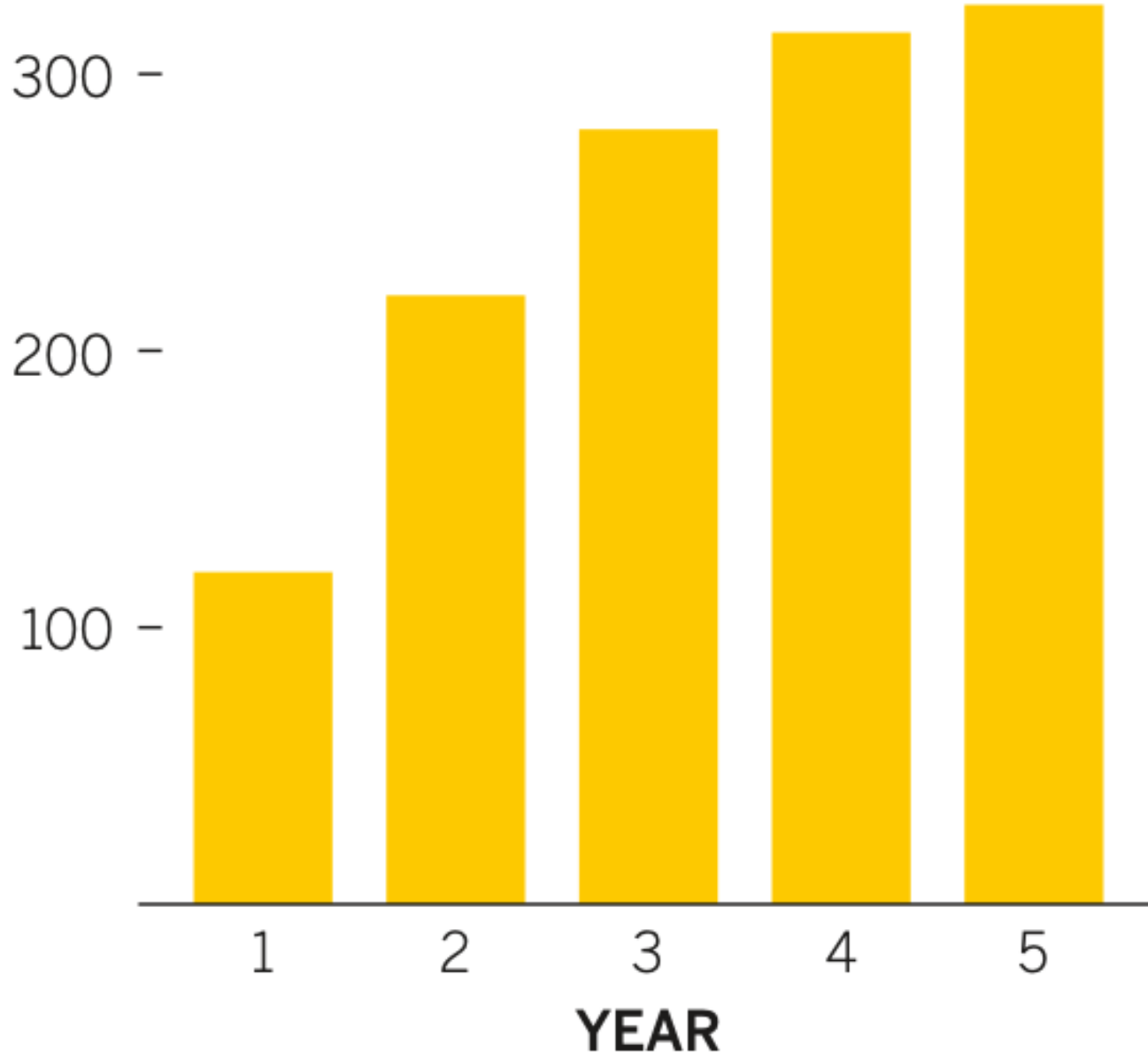
CUMULATIVE REVENUE
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SOURCE: COMPANY RESEARCH

REVENUE GROWTH

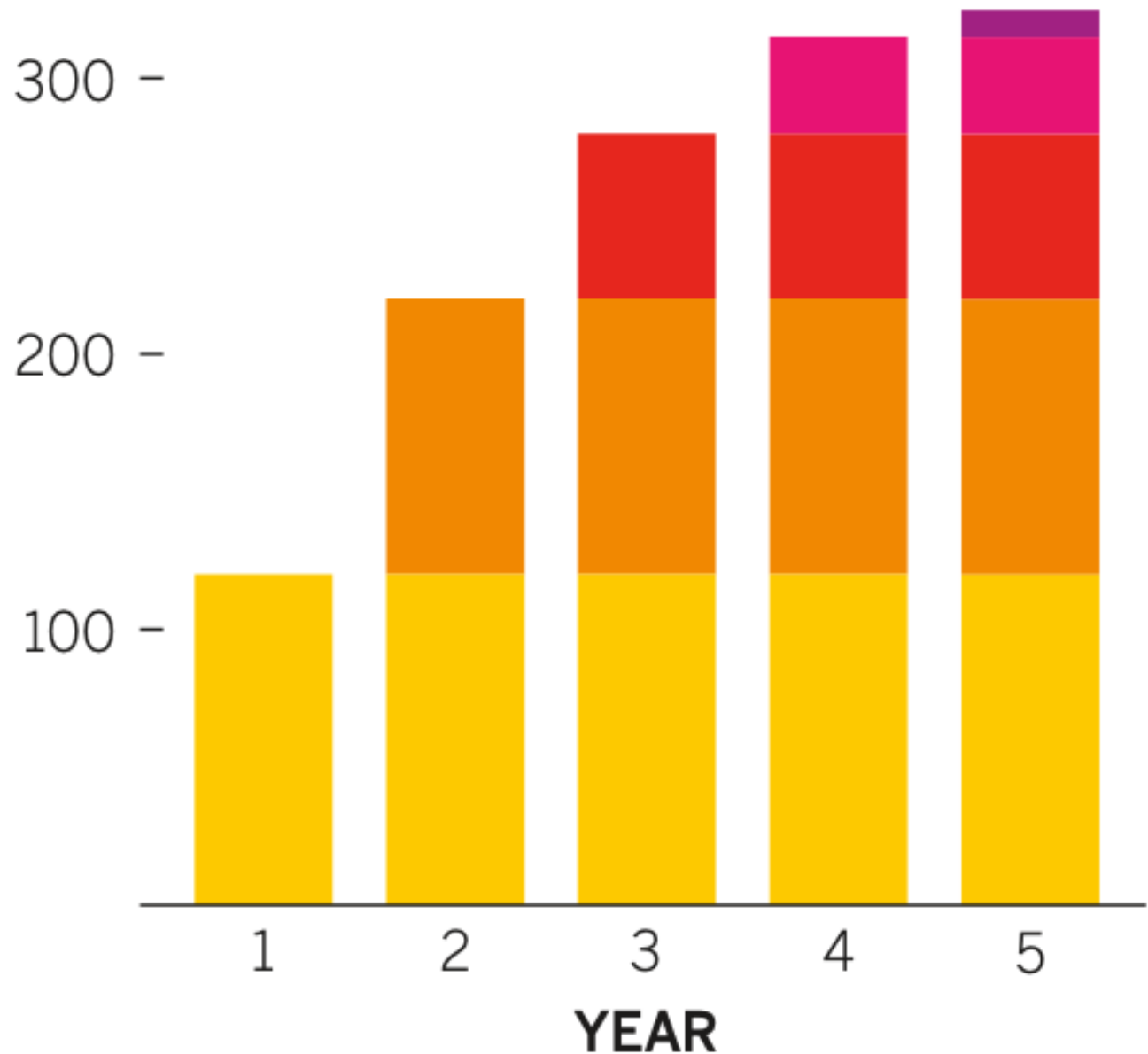
CUMULATIVE REVENUE
\$400 million



SOURCE: COMPANY RESEARCH

REVENUE GROWTH

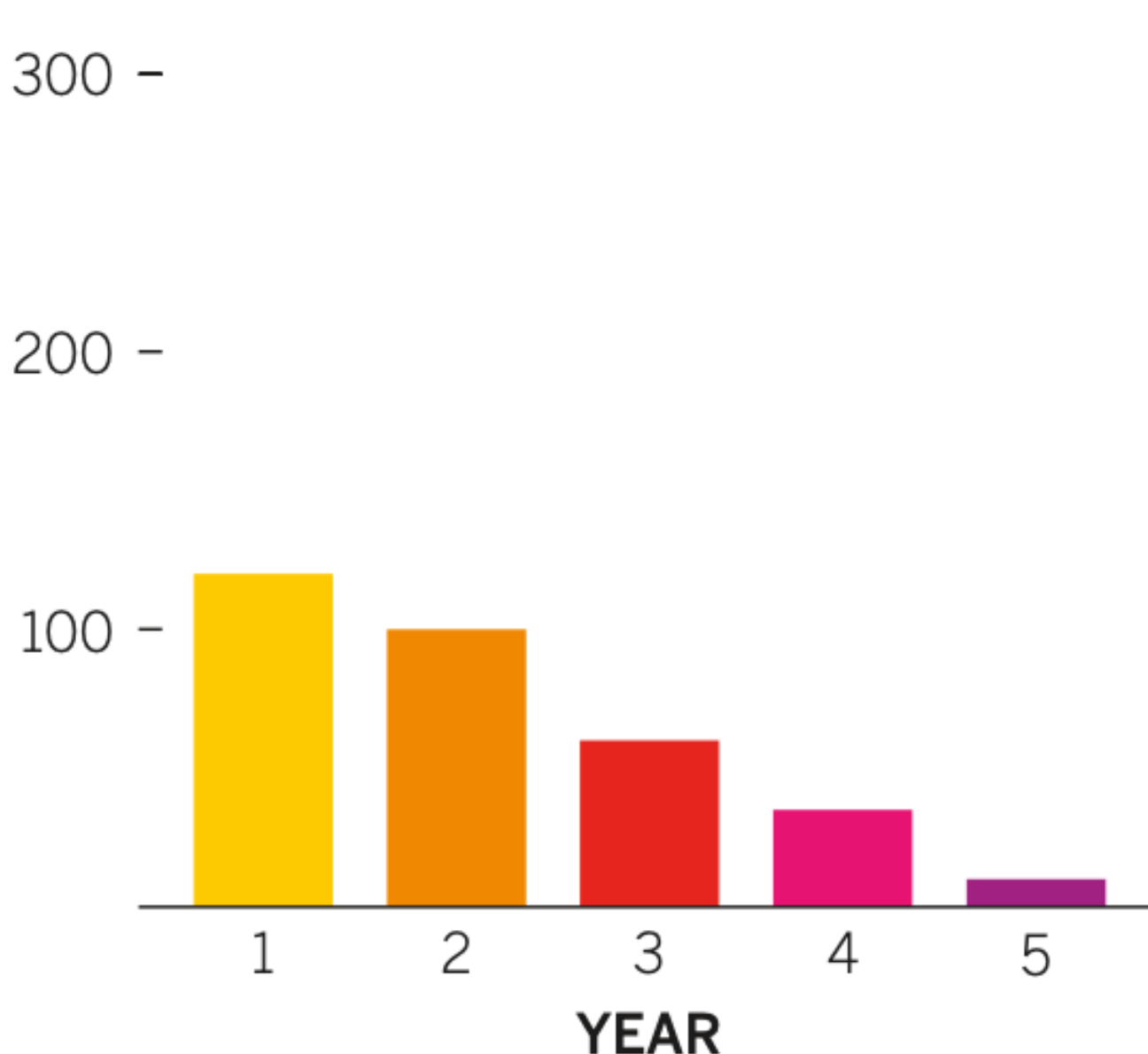
CUMULATIVE REVENUE
\$400 million



SOURCE: COMPANY RESEARCH

FIVE-YEAR REVENUE TREND

ANNUAL REVENUE EARNED
\$400 million

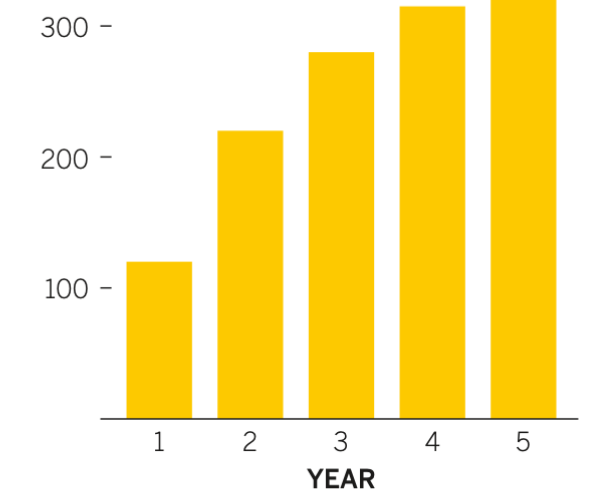


Are any of these charts inaccurate?

Year	Cumulative Revenue (Million \$)
1	120
2	210
3	280
4	310
5	320

REVENUE GROWTH

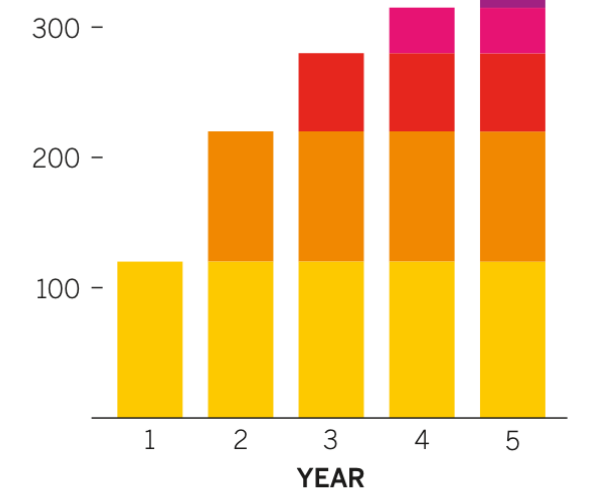
CUMULATIVE REVENUE
\$400 million



SOURCE: COMPANY RESEARCH

REVENUE GROWTH

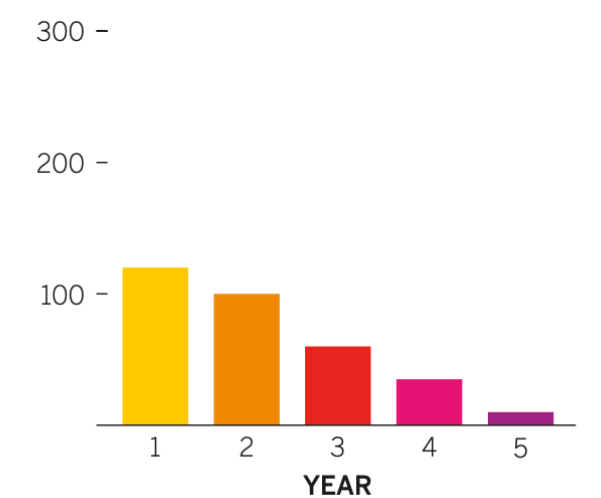
CUMULATIVE REVENUE
\$400 million



SOURCE: COMPANY RESEARCH

FIVE-YEAR REVENUE TREND

ANNUAL REVENUE EARNED
\$400 million

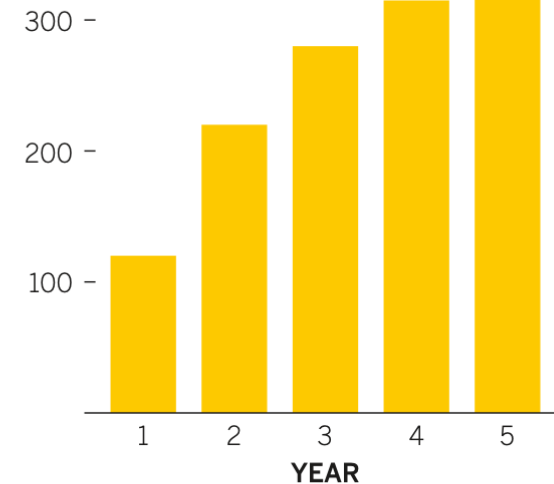


We can easily convert cumulative revenue to yearly revenue

Year	Revenue	Cumulative Revenue (Million \$)
1	120	120
2	90	210
3	70	280
4	30	310
5	10	320

REVENUE GROWTH

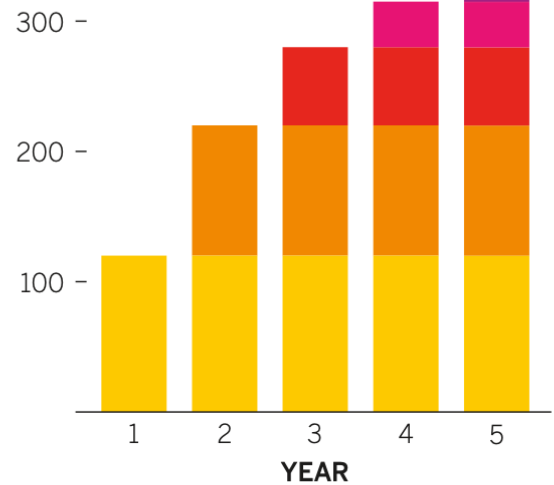
CUMULATIVE REVENUE
\$400 million



SOURCE: COMPANY RESEARCH

REVENUE GROWTH

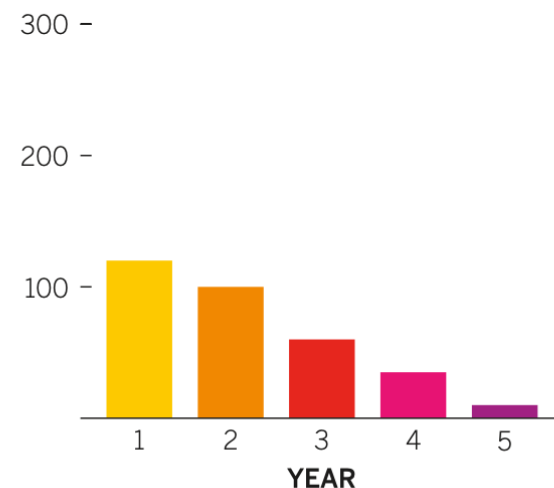
CUMULATIVE REVENUE
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SOURCE: COMPANY RESEARCH

FIVE-YEAR REVENUE TREND

ANNUAL REVENUE EARNED
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How to decide

What should the visualisation say?

- What objective are we trying to achieve?
- Who's the audience?
- What delights and frustrates this audience?
- What data is available to us? What else could we bring in?

I am trying to convince _____

About _____

So that they _____

I am trying to convince WHO

About WHAT

So that they WHY

I am trying to convince AUDIENCE

About STATEMENT/ARGUMENT

So that they DO AN ACTION



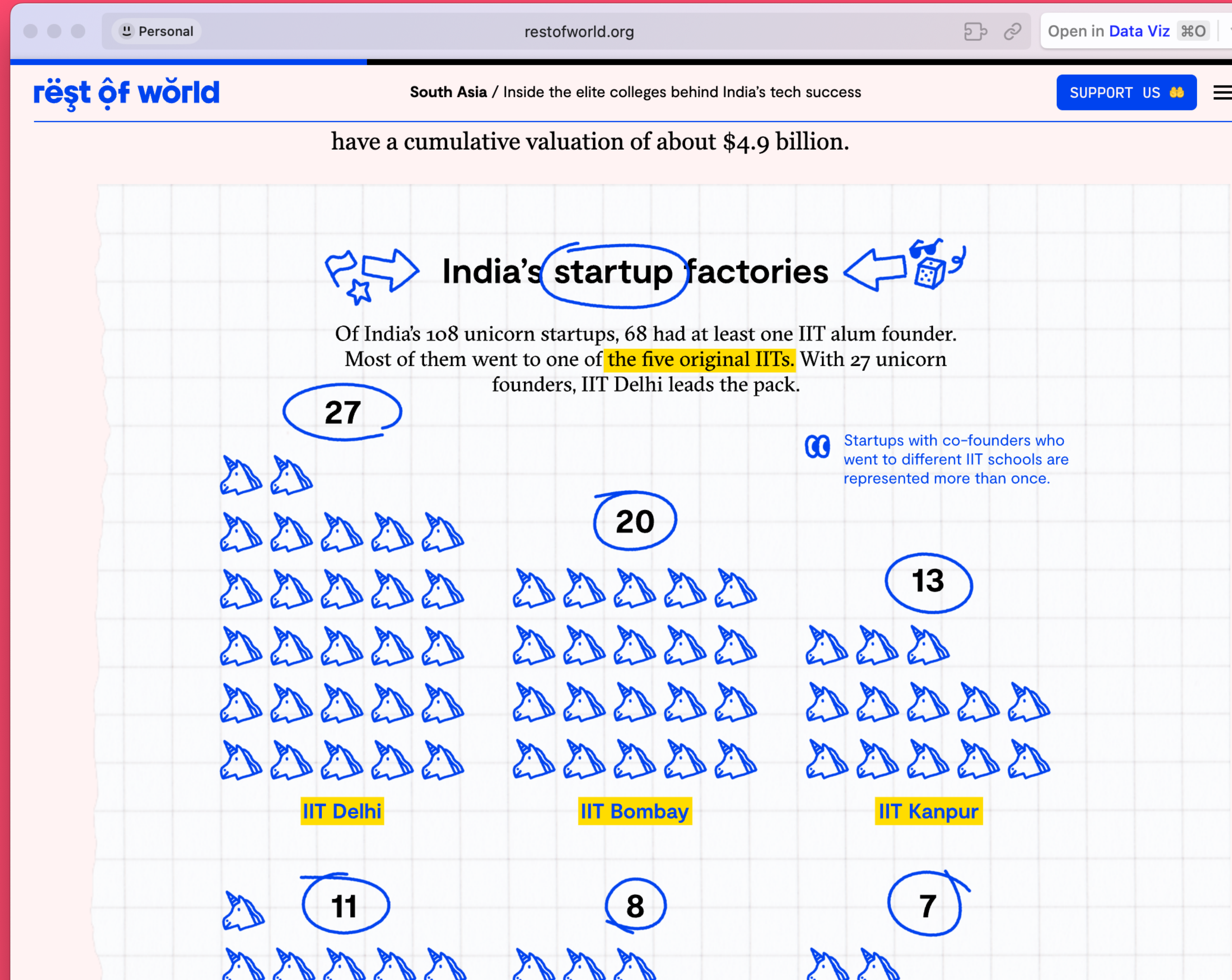
<https://viz.wtf/post/667583513306005504/the-drying-time-could-be-literally-anything-and>

I am trying to convince PEN USERS

About SARASA DRY DRIES MUCH FASTER THAN OTHER PENS

So that they BUY SARASA DRY

Inside the elite colleges behind India's tech success - Rest of World



I am trying to convince _____

About _____

So that they _____

I am trying to convince READERS

About GOING TO IIT REALLY MAKES A DIFFERENCE FOR TECH CAREERS

So that they ARE CONVINCED ABOUT THE POINT OF THE ARTICLE



Another way to think about

Is a data visualisation effective?

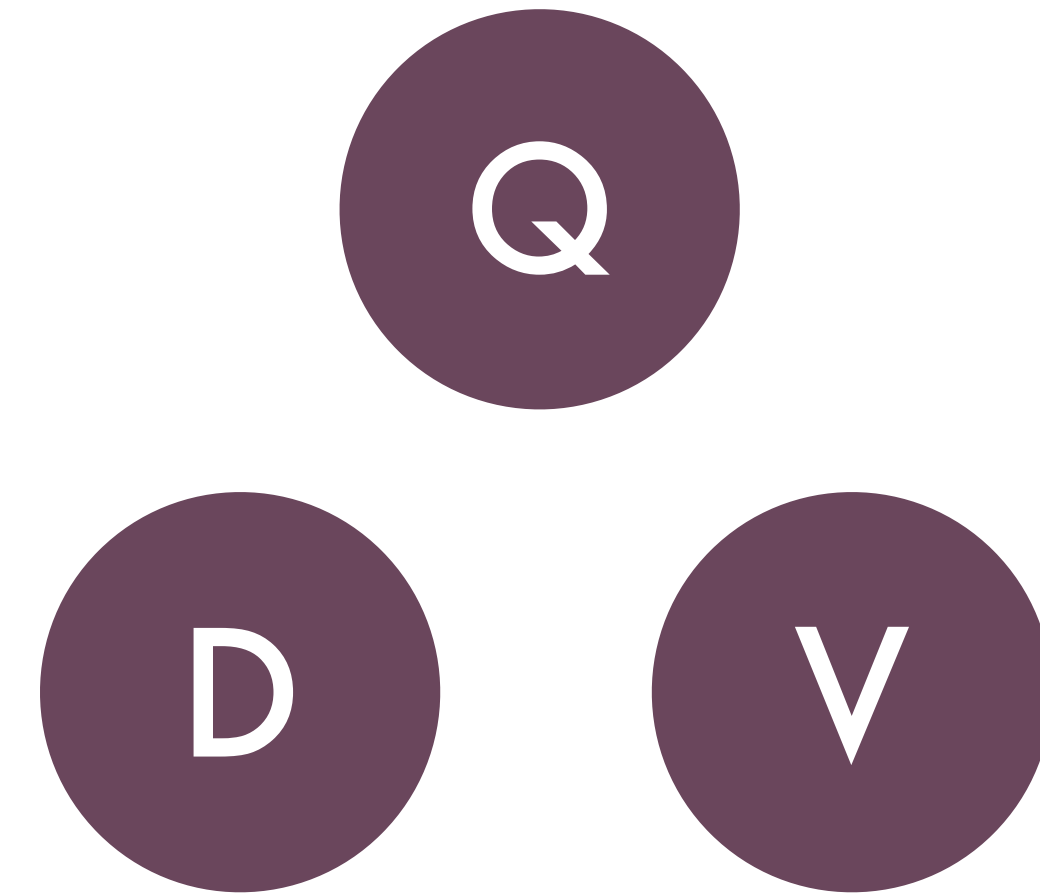
Critiquing Data Visualisations

The Trifecta Check

- What is the **QUESTION**?
- What does the **DATA** say?
- What does the **VISUAL** say?

Ideally, all three are the same.

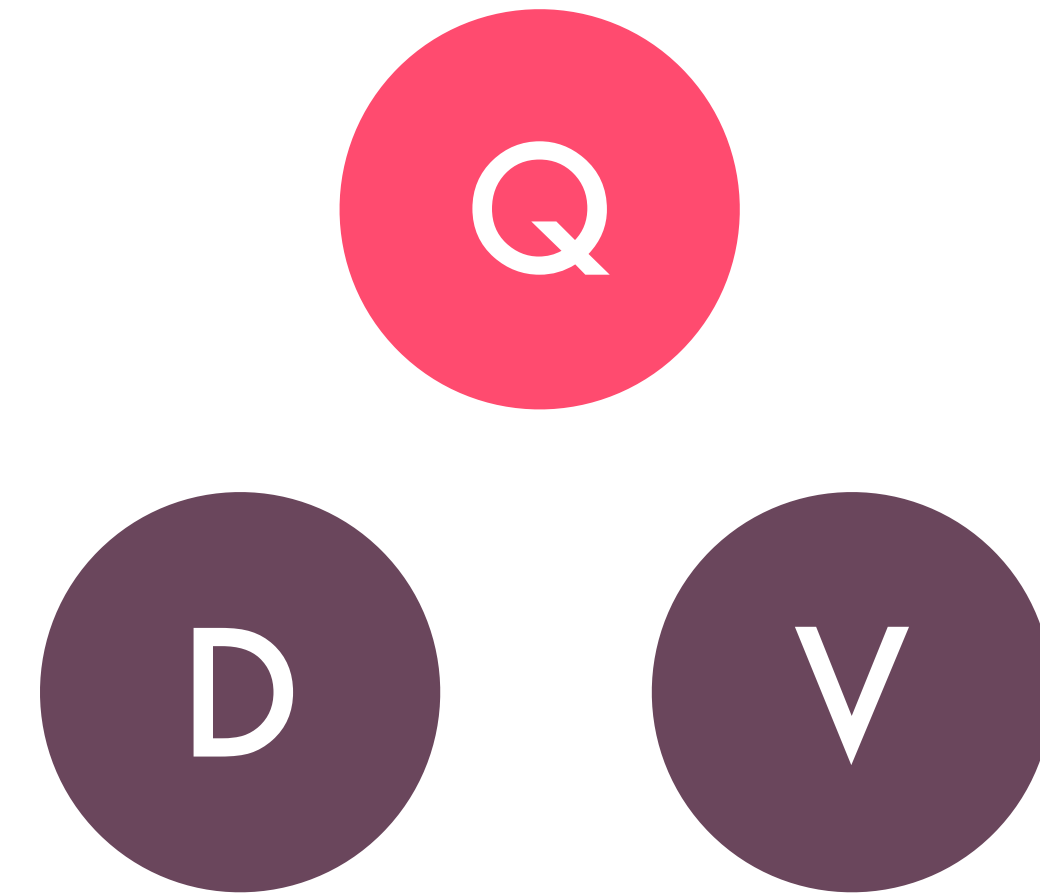
Source: [Chart Junk Trifecta Checkup](#)

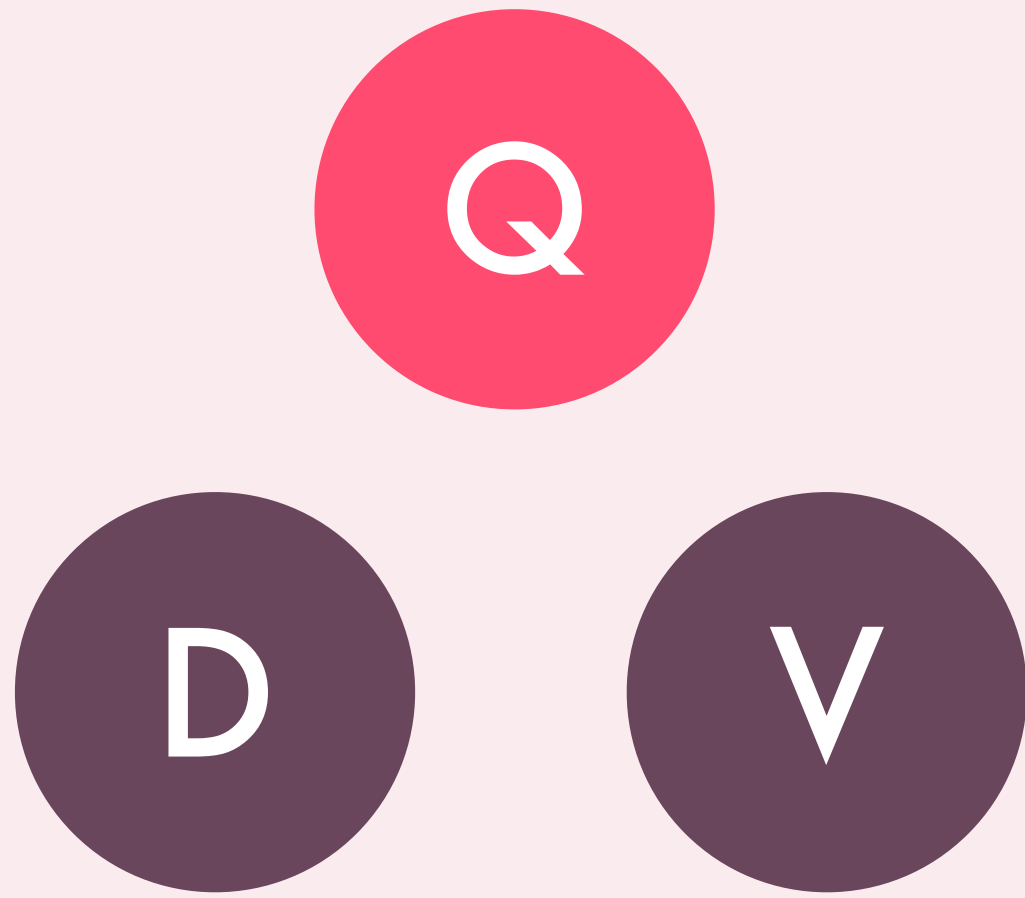


The Trifecta Check

The Question

- Any data visualization project needs a worthy cause.
- The Question should be **well-posed** to focus the search for appropriate data.
- The Question should be **interesting** to ensure an engaged audience.





South Koreans drink twice as much liquor as Russians and more than four times as much as Americans

[Quartz](#) ↗

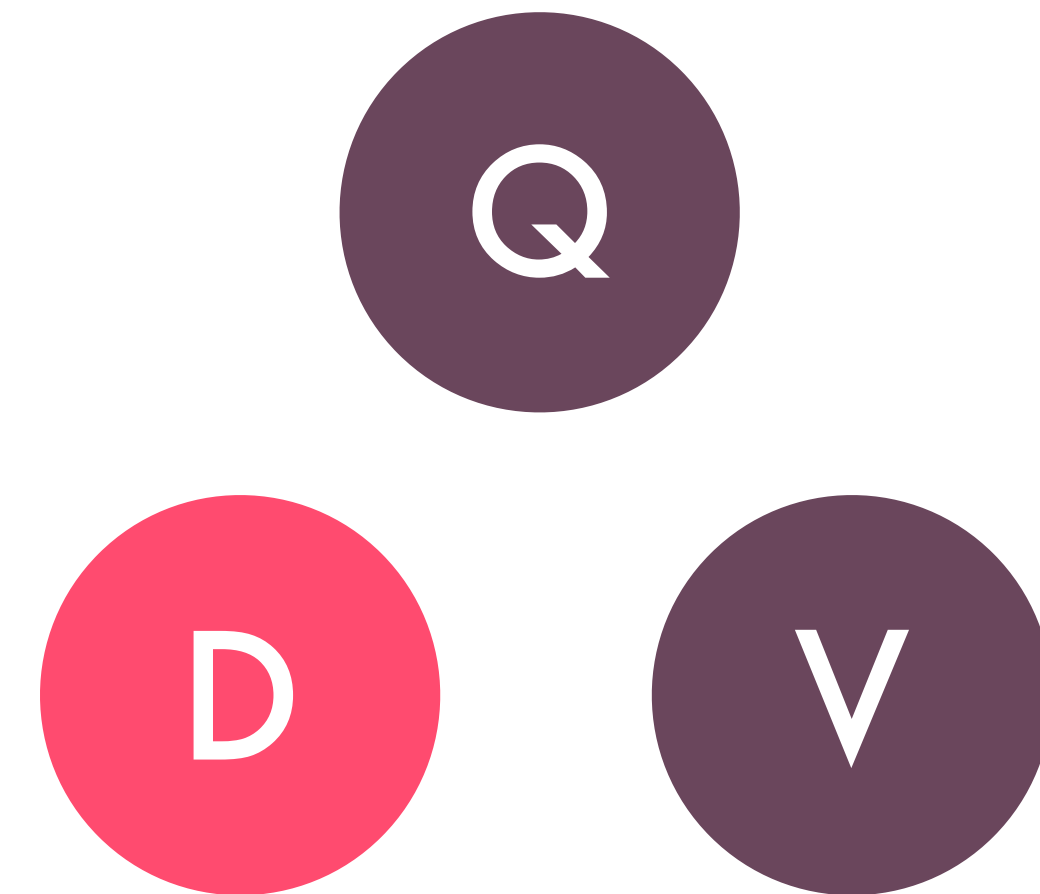
The screenshot shows the Quartz website interface. At the top, there's a navigation bar with 'KOTAKU QUARTZ THE ROOT | THE INVENTORY'. Below that is a search bar and 'Free Newsletters' link. The main header 'QUARTZ' is prominent. A secondary navigation bar includes 'HOME LATEST BUSINESS NEWS MONEY & MARKETS TECH & INNOVATION A.I. LIFESTYLE LEADERSHIP EMAILS PODCA'. The article is categorized under 'BUSINESS NEWS'. The title is 'South Koreans drink twice as much liquor as Russians and more than four times as much as Americans'. The author is 'By Roberto A. Ferdman' and it was 'Published February 2, 2014'. Social media sharing icons for Twitter, Facebook, Reddit, Email, and Link are present. Below the article is a chart titled 'The average amount of liquor consumed by a person of drinking age' with the subtitle 'Shots per week of any spirit'. The chart shows data for S. Korea (13.7), Russia (5.4), Philippines (4.5), Thailand (4.4), Japan (3.9), Bulgaria (3.9), Ukraine (3.8), Slovakia (3.8), and Brazil (3.8).

Country	Shots per week of any spirit
S. Korea	13.7
Russia	5.4
Philippines	4.5
Thailand	4.4
Japan	3.9
Bulgaria	3.9
Ukraine	3.8
Slovakia	3.8
Brazil	3.8

The Trifecta Check

The Data

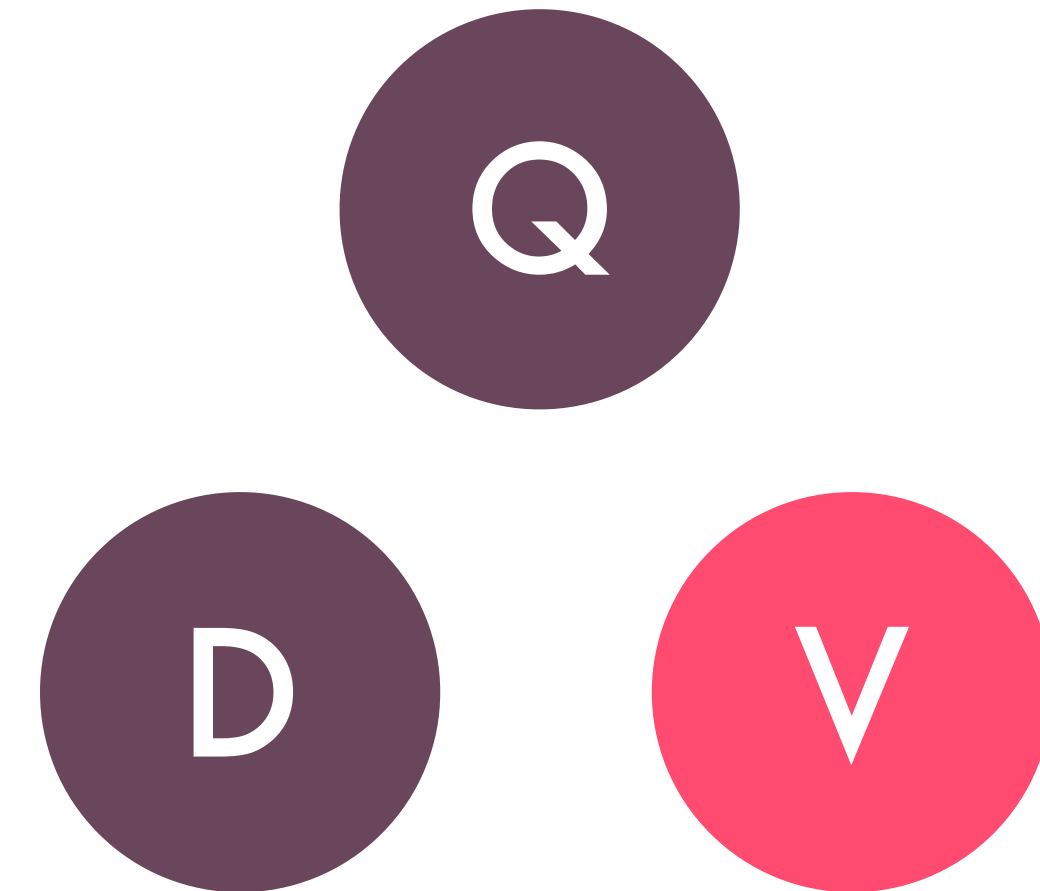
- The Data should be **relevant** to the Question being addressed.
- Relevance can often be augmented by reducing noise, removing errors or transformations.



The Trifecta Check

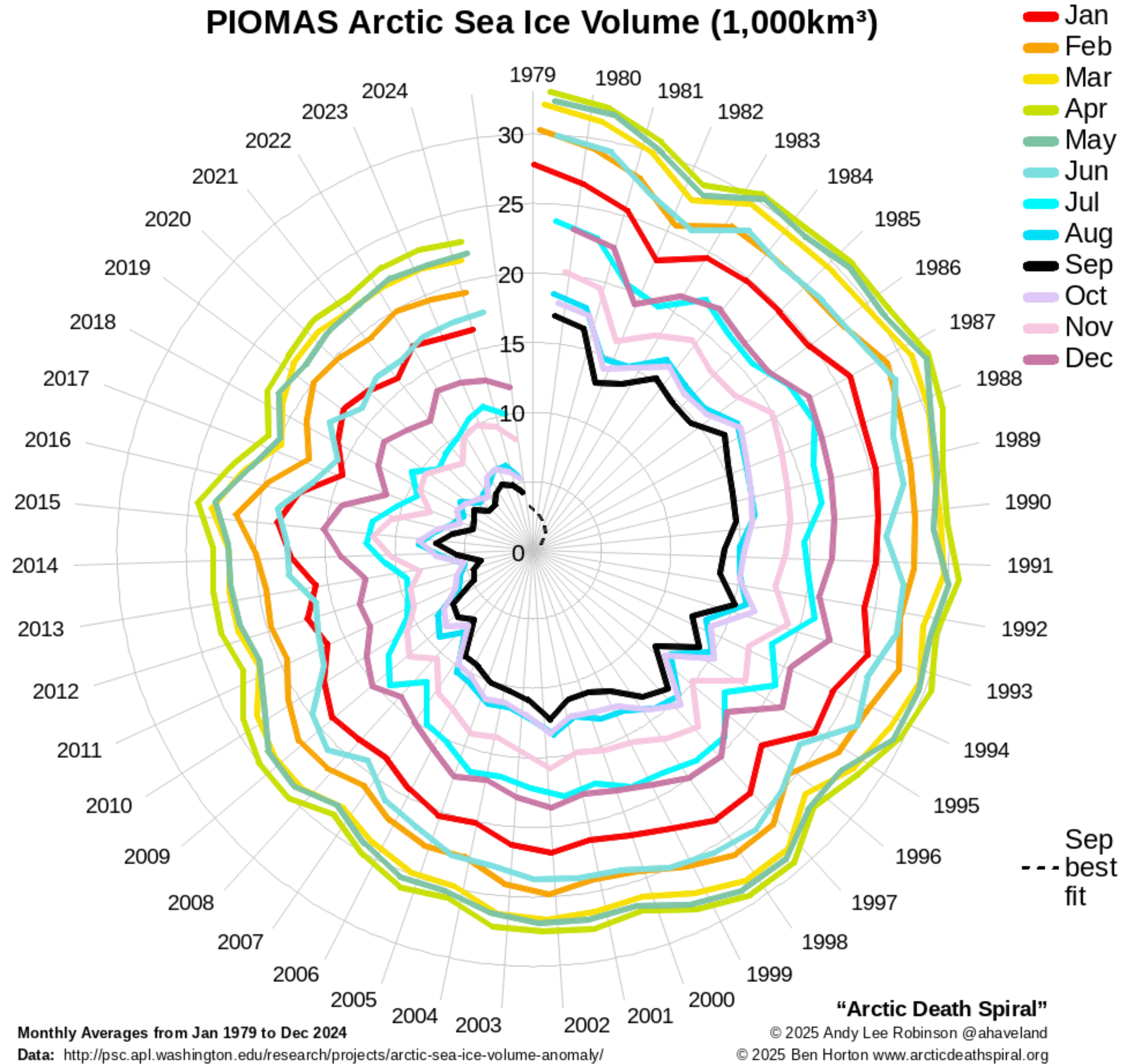
The Visuals

- The Visual elements should represent the Data in a **clear, concise** manner.
- The visuals should address the Question directly.

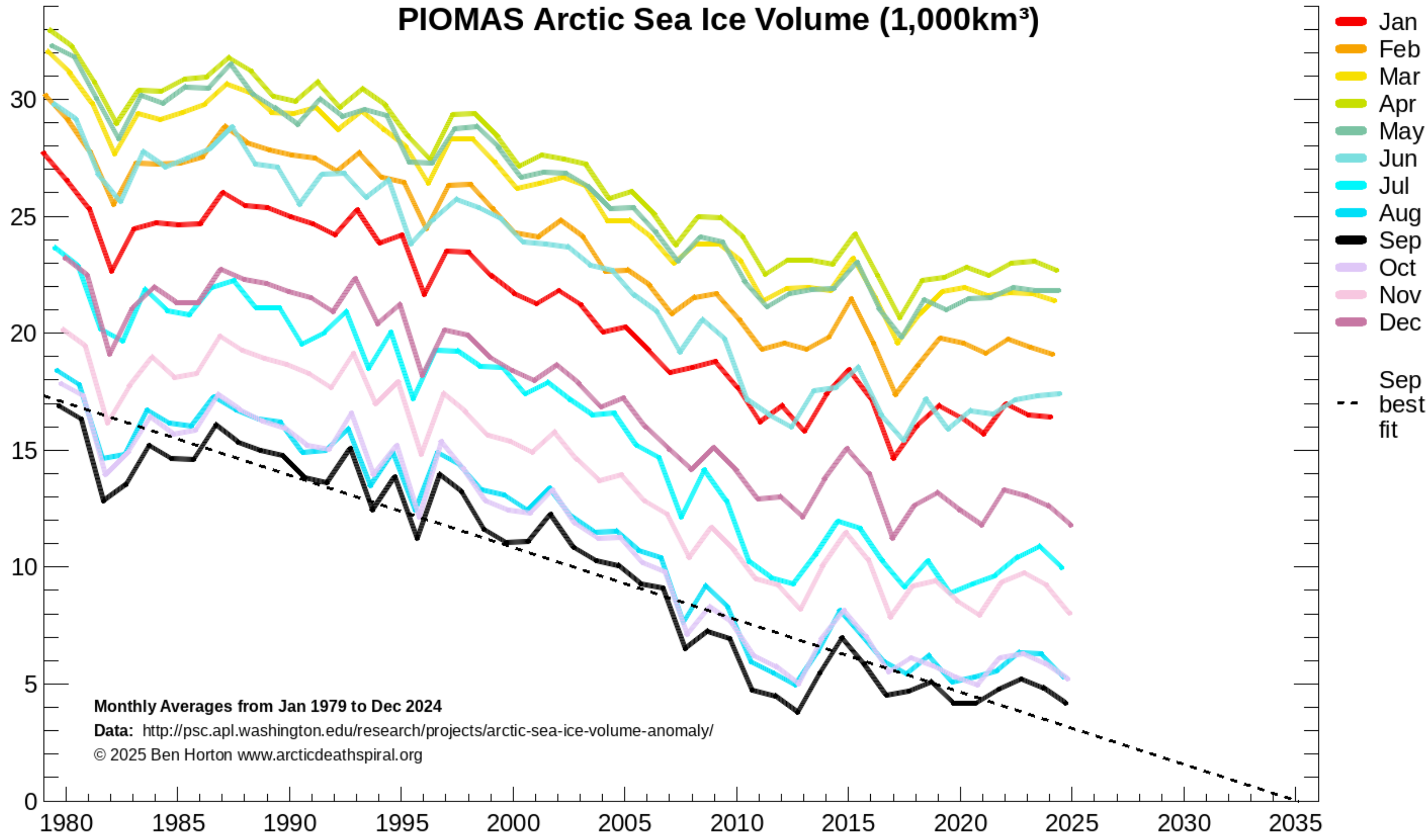


What's The Arctic Death Spiral? Spider Chart

[Arctic Death Spiral](#) ↗



PIOMAS Arctic Sea Ice Volume (1,000km³)



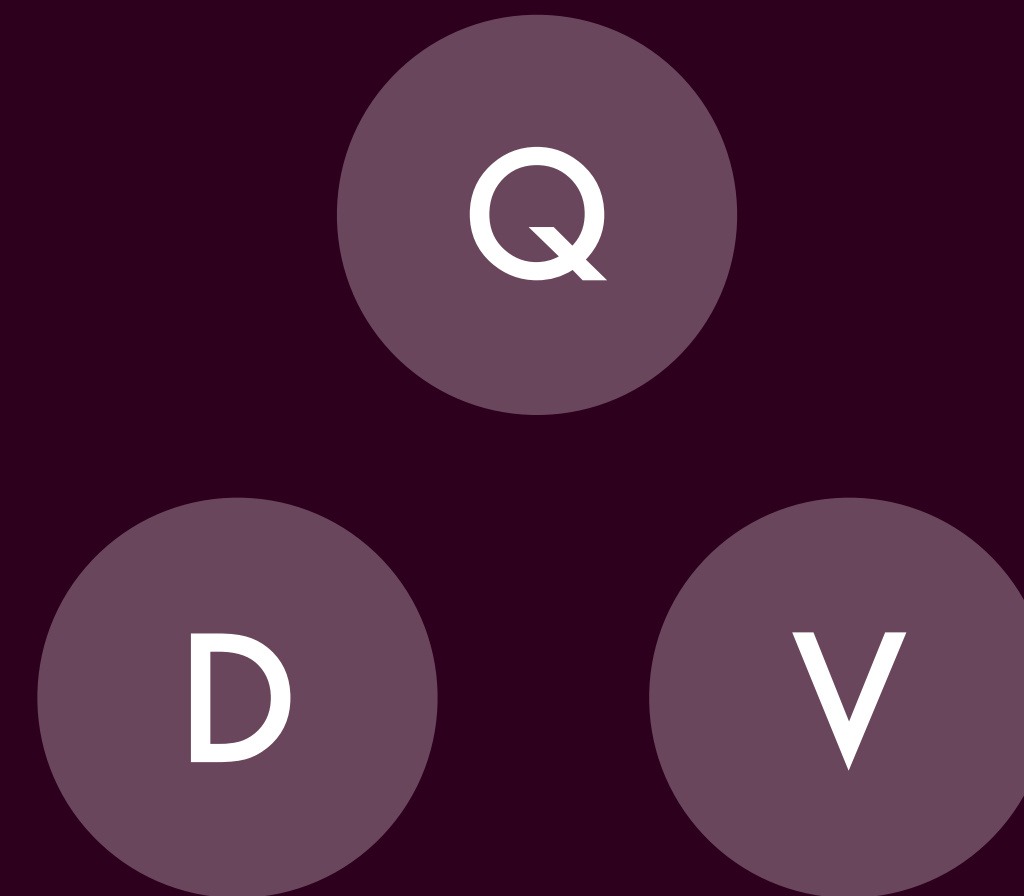
Monthly Averages from Jan 1979 to Dec 2024
Data: <http://psc.apl.washington.edu/research/projects/arctic-sea-ice-volume-anomaly/>
© 2025 Ben Horton www.arcticdeathspiral.org

Recap

2 ways of evaluating data viz

I am trying to convince WHO
About WHAT
So that they WHY

Who-What-Why



Question-Data-Visuals

Classroom Crits


Some Rules

- Keep feedback respectful and focused on the work, not the person. We're all here to learn.
- If you liked something, call it out! If you don't, try and explain why.
- You can use "I wonder..." or "Have you considered...?" to open discussions.
- You can and should build on each other's ideas, but let people finish their thought and avoid interruptions.
- Understand that choices are made based on available data, audience, and format limitations. What were the tradeoffs involved?

Presentations

Critique and Redesign

The image shows a browser window with the URL gyanl.com. The page content includes a navigation menu with 'Data Visualization', 'About', and 'Syllabus'. The main heading is 'Exercise - Critique and Redesign'. Below it is a section for 'Reference Material' with a paragraph of text, and an 'Instructions' section with a paragraph of text.

Data Visualization [About](#) [Syllabus](#) 

Exercise - Critique and Redesign

Reference Material

See [Which Chart to Use](#) for a list of reference material that show the different types of data and the types of charts that can be used to represent them.

Instructions

Create teams of 2. If you are comfortable with a visualisation tool, try pairing up with someone who is struggling.

**How can
data tell
stories?**





It has been
0 day(s)
since I smacked
someone for
no reason.

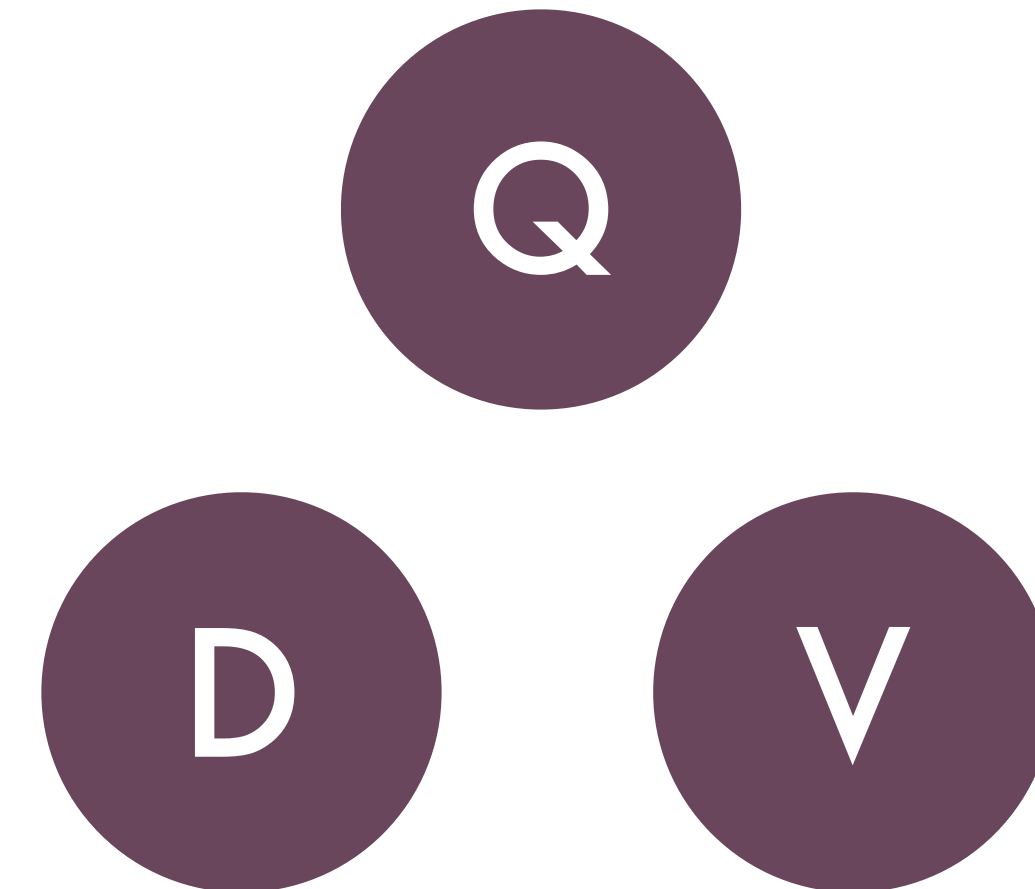
A manager wants to make the case that the tech team should automate two menial processes.

Each task takes only a few seconds, but both must be done constantly. He wants to show that performing the task dozens of times a day adds up over time. So he simply adds up all the time and plots it.

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I am trying to convince WHO
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TASK 1 AND TASK 2

HOURS LOST PER YEAR

120 -

80 -

40 -

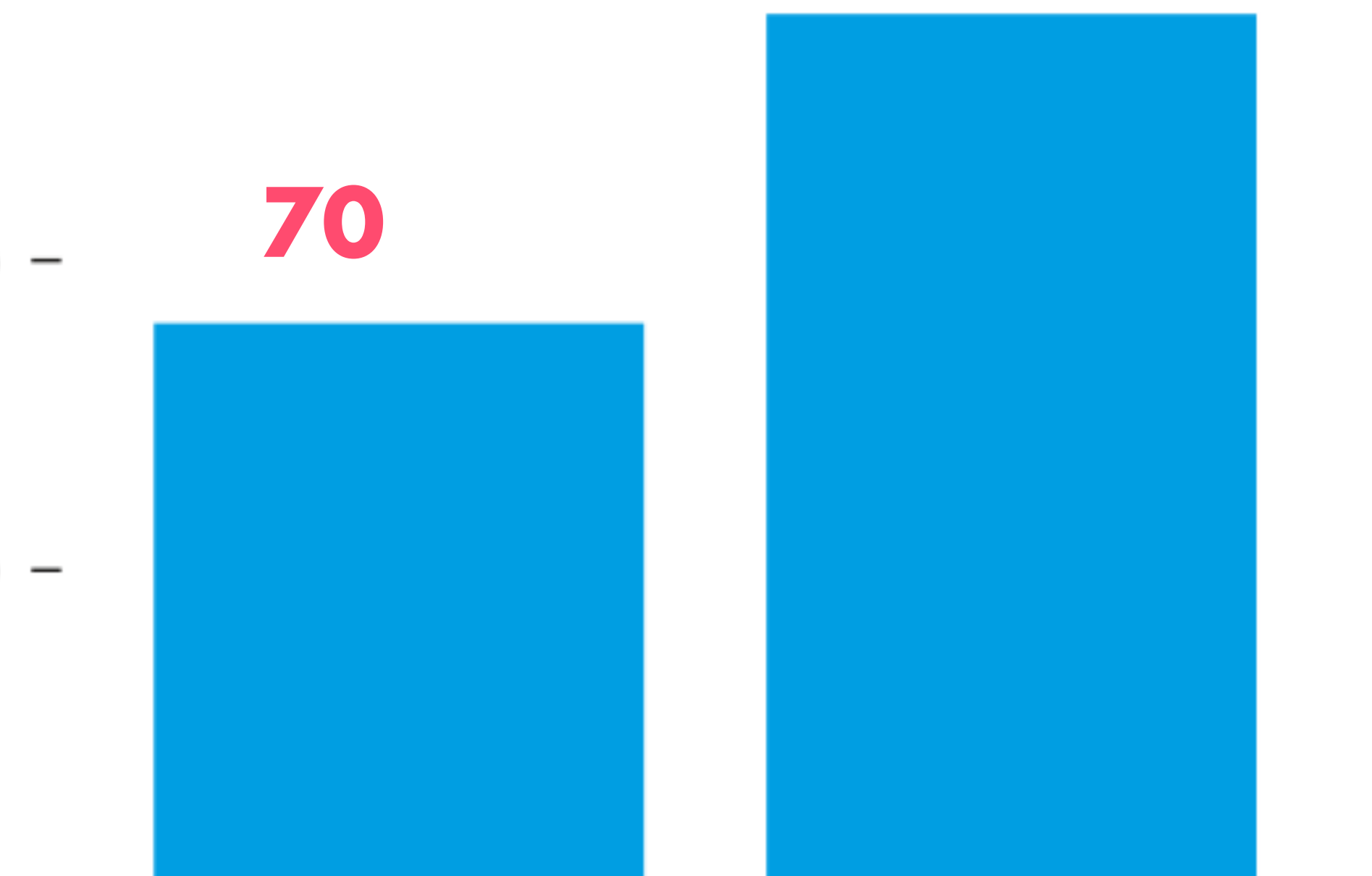
110

70

Task 1

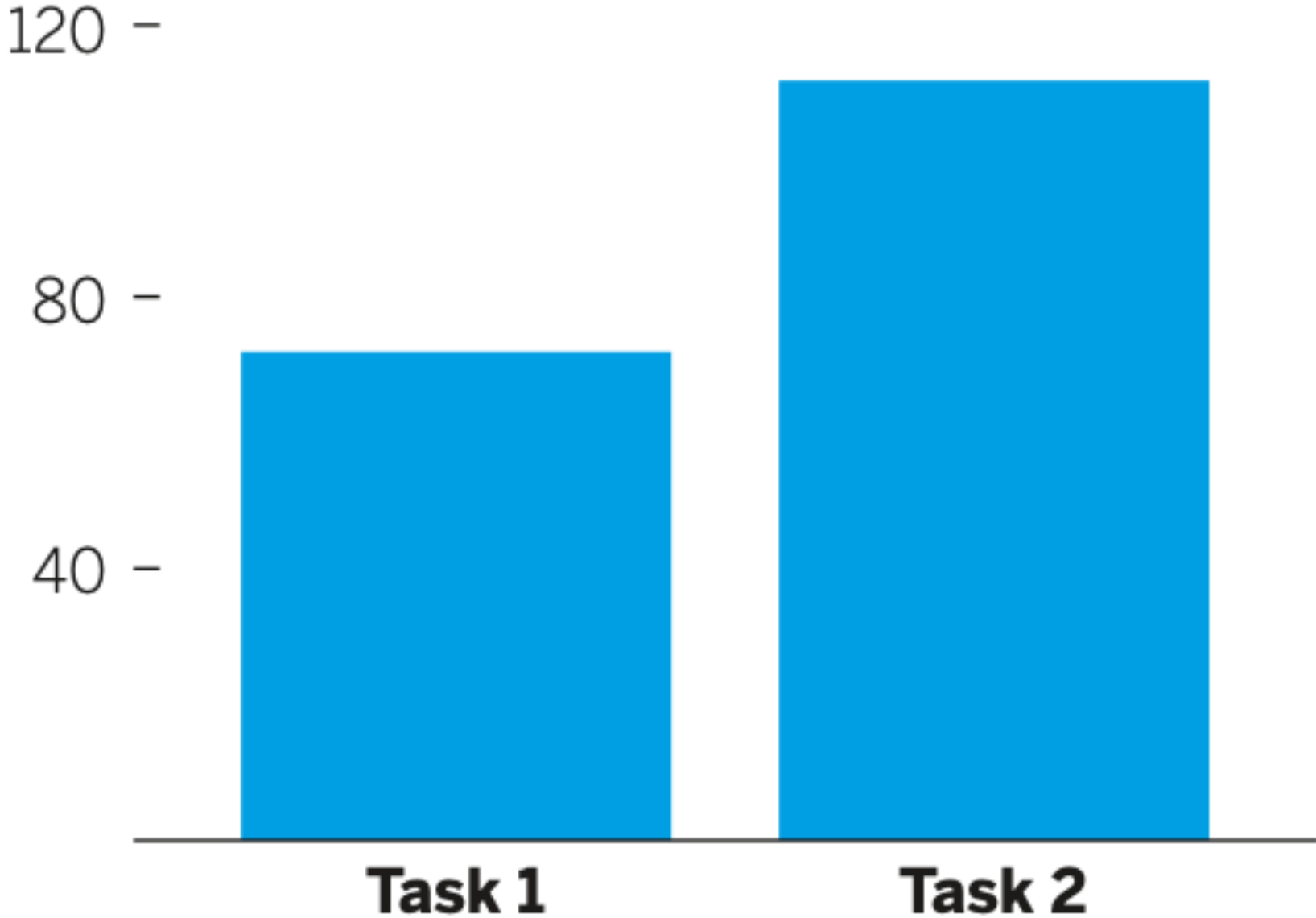
Task 2

SOURCE: COMPANY RESEARCH



TASK 1 AND TASK 2

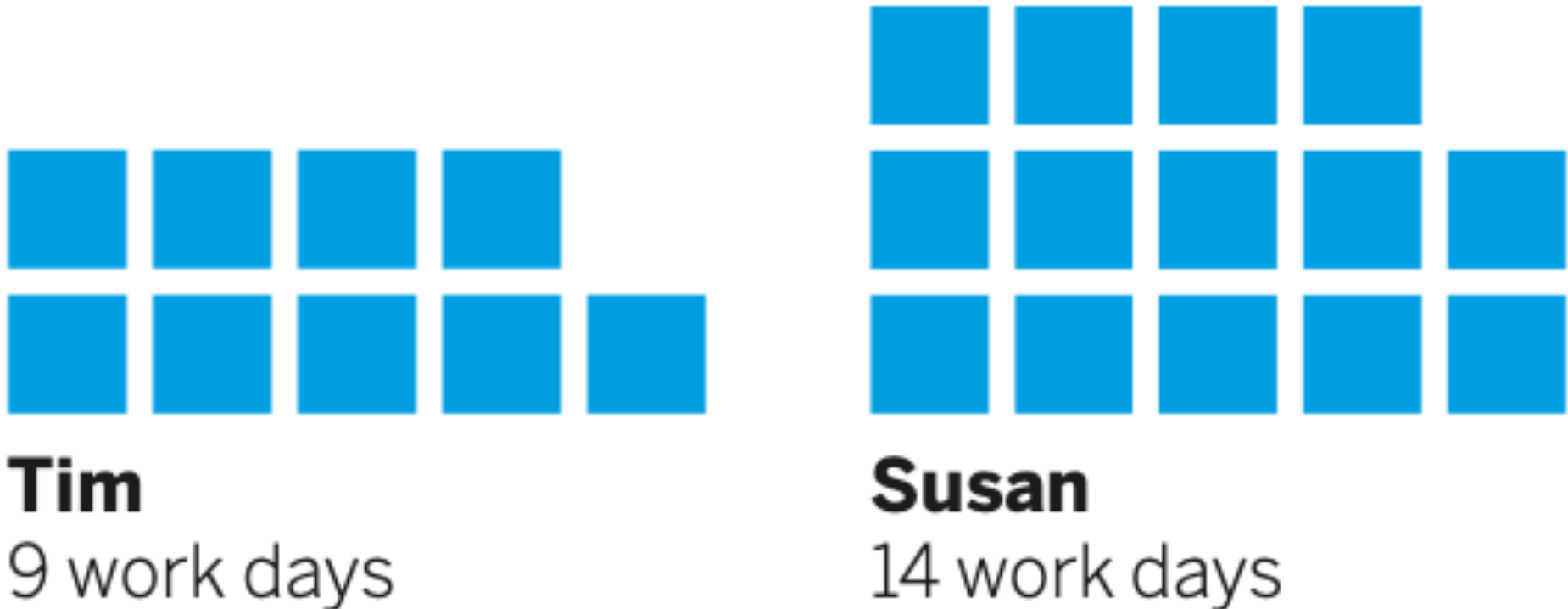
HOURS LOST PER YEAR



SOURCE: COMPANY RESEARCH

DAYS LOST TO TASK 1 AND TASK 2: TIME SINK

WORK DAYS LOST PER YEAR



SOURCE: COMPANY RESEARCH

**Stories can
humanise data.**